

Rhode Island State Energy Plan

Advisory Council Meeting #4

April 1, 2013

Advisory Structure

Advisory Council

- Meets on a monthly basis
- Evaluates and provides feedback on research to assist staff in preparing a Preliminary Draft Plan
- Recommends Preliminary Draft Plan to the State Planning Council's Technical Committee for forwarding to the State Planning Council for public hearing, revision, and adoption

Timeline

Project Phases

Phase I: Research & Data Collection (December 2012 – May 2013)

Gather and synthesize the best available energy data; Set measurable goals based on modeling analysis and stakeholder feedback; Design an actionable implementation strategy

Phase II: Preparation of Preliminary Draft Plan (June 2013 – September 2013)

Distill research developed during Phase I into a Preliminary Draft Plan

Phase III: Technical & Public Review (October 2013 – March 2014)

Vet Preliminary Draft Plan through a technical and public review process; Adopt Plan as State Guide Plan Element

Today

April Meeting

Agenda:

- Presentation of preliminary results from Task 1: Baseline & Task 2: Forecast
- Presentation of updated directional objectives
- Introduction to Task 3: Scenarios

Preliminary Findings

TASK 1: BASELINE

Rhode Island State Energy Plan Scope

- **Gather Data**: *Analyze and quantify the amount, cost, supply, and environmental effects of all forms of energy resources—currently used, and potentially available to use—within all sectors in Rhode Island.*
- **Set Goals**: *Identify measurable targets for providing energy services using a resource mix that meets a set of criteria advancing the health, environmental, economic, and human wellbeing of the people, communities, and environment of Rhode Island.*
- **Recommend Action**: *Design a comprehensive implementation strategy to meet the goals of the Plan through public, private, and individual efforts.*

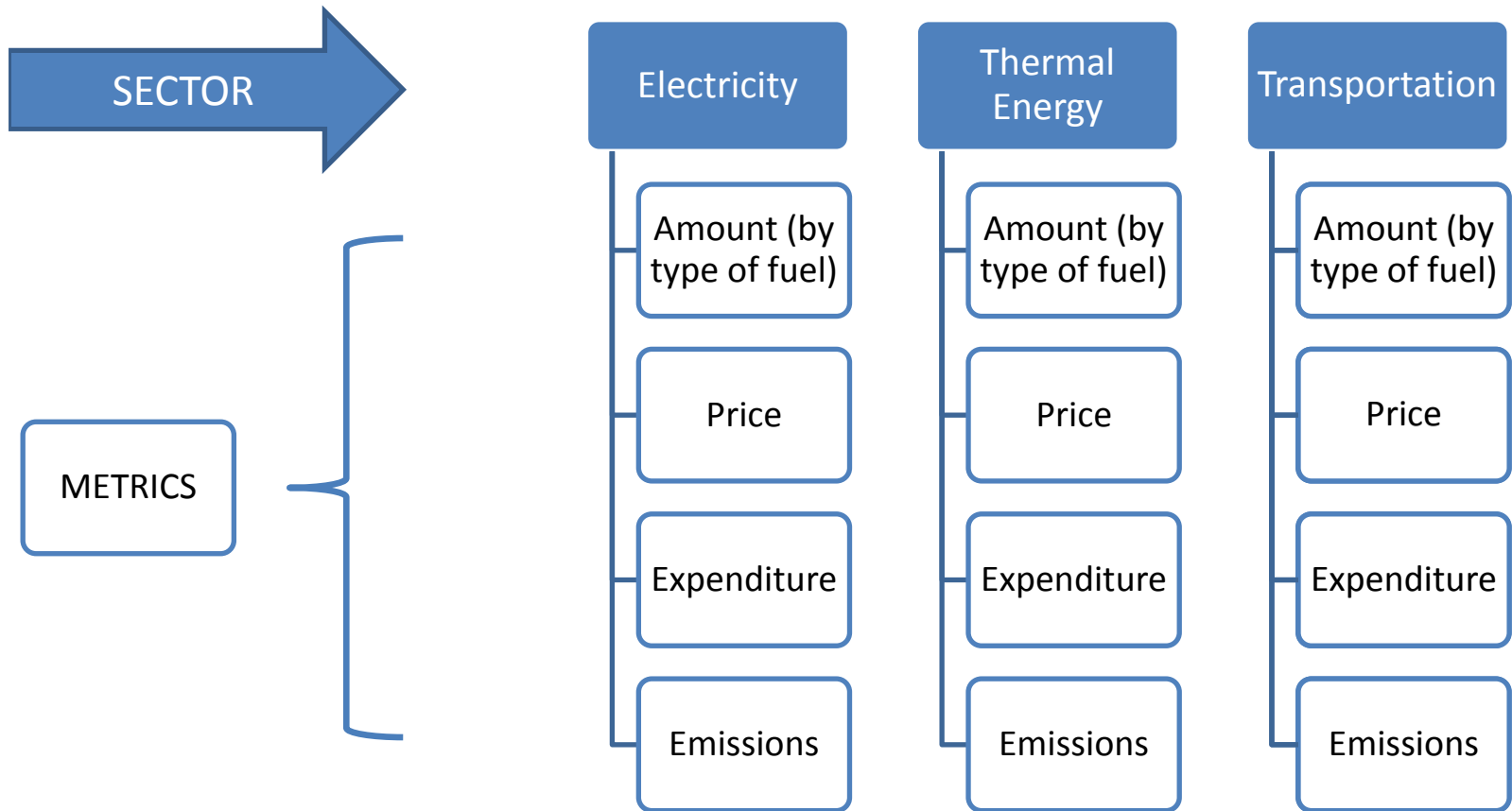
Step 1 - **Gather Data**

“What do we face?”

- **Gather Data**: *Analyze and quantify the amount, cost, supply, and environmental effects of all forms of energy resources—currently used, and potentially available to use—within all sectors in Rhode Island.*

Step 1 - *Gather Data*

TASK 1: BASELINE



TASK 1 - *Baseline*

Whole Energy System

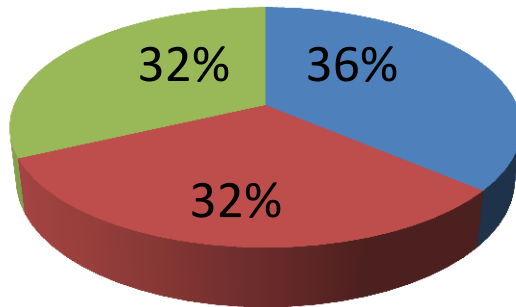
- In **2010**, Rhode Island consumed **199,000 Billion BTUs** of energy. This fuel consumption cost **\$3.6 billion** and generated **11 million tons** of CO2 emissions

| Sector | Consumption (Billion BTU) | Expenditure (Million \$) | Carbon Emissions (Metric Tons) |
|----------------|------------------------------|-----------------------------|-----------------------------------|
| Electricity | 72,132 | \$ 1,097.80 | 2,934,632 |
| Thermal | 63,269 | \$ 1,108.90 | 3,909,238 |
| Transportation | 63,627 | \$ 1,378.20 | 4,486,604 |
| Total | 199,028 | \$ 3,584.90 | 11,330,473 |

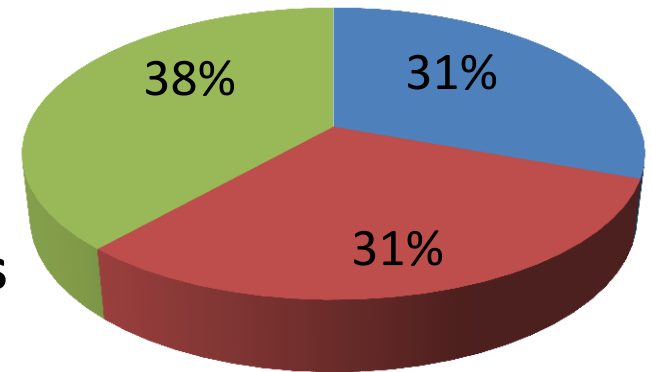
TASK 1 - *Baseline*

Whole Energy System

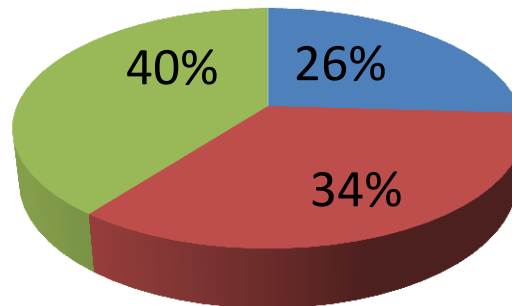
**Consumption
(Billion BTU)**



Expenditure (Million \$)



**Carbon Emissions
(Metric Tons)**

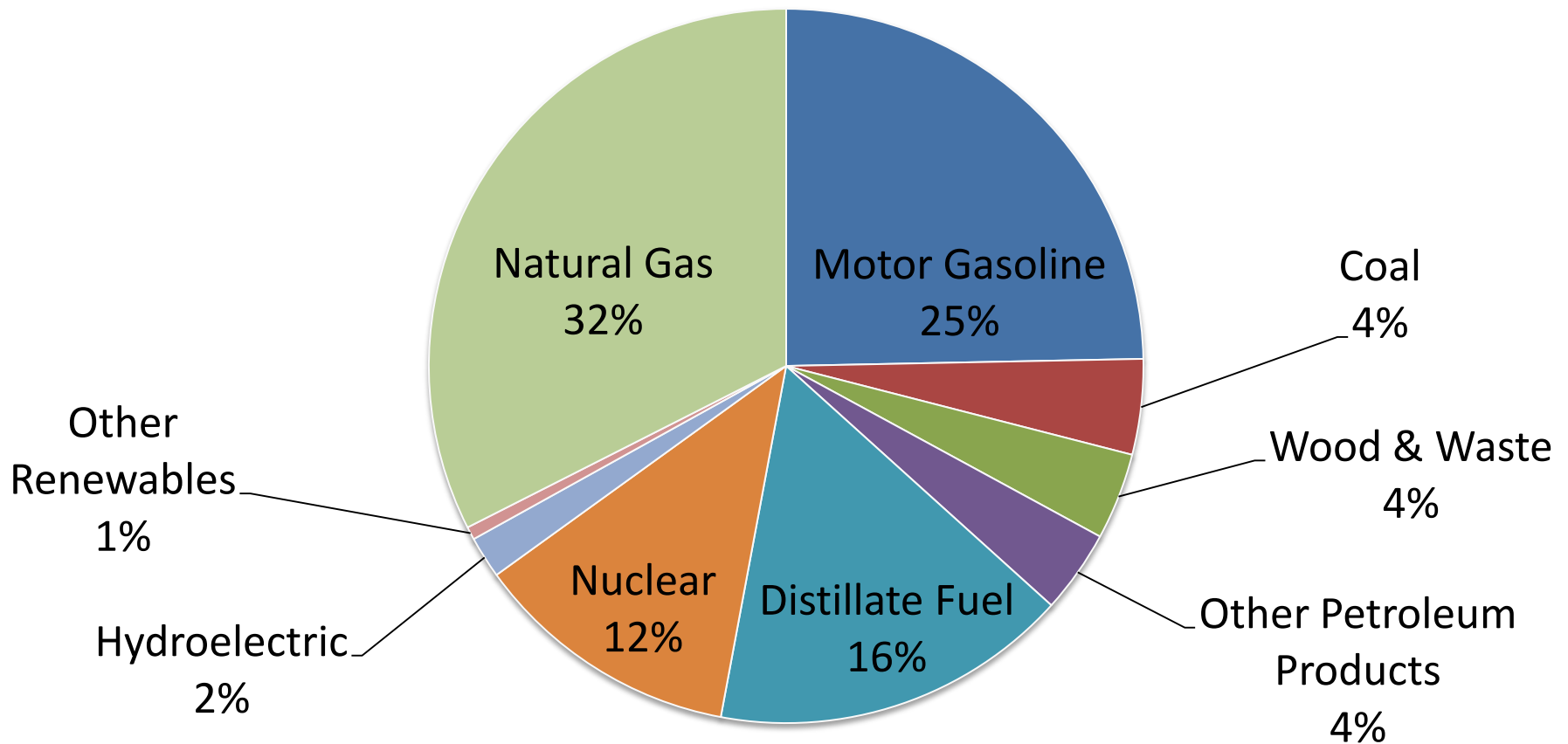


■ Electricity ■ Thermal ■ Transportation

TASK 1 - *Baseline*

Whole Energy System

Rhode Island Fuel Consumption 2010 - All Sectors



TASK 1 - *Baseline*

Electricity: Summary

- In **2010**, Rhode Island's electric sector consumed **8,346 GWh** of energy. This fuel consumption cost **\$1.1 billion** and generated **2.9 million tons** of CO₂ emissions

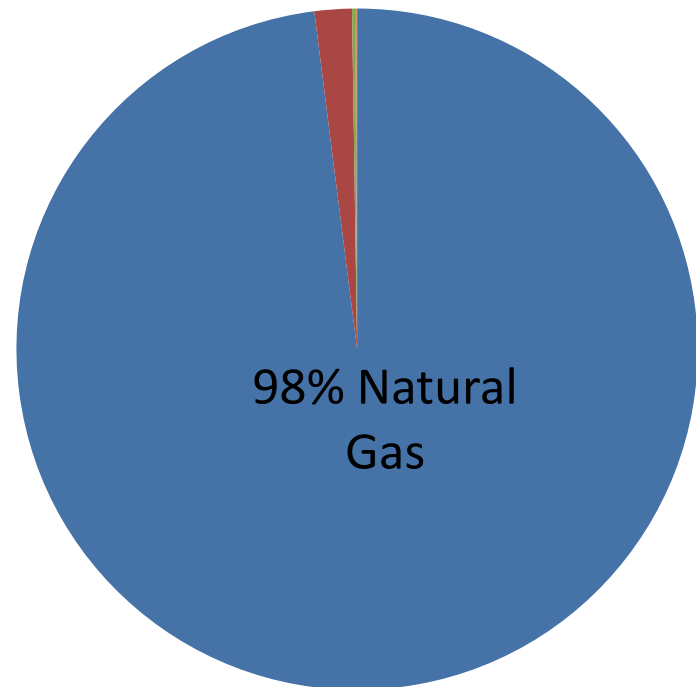
TASK 1 - *Baseline*

Electricity: In-State Generation

| Fuel | Net Generation (MWh) |
|---------------------|----------------------|
| Natural Gas | 7,583,281 |
| Landfill Gas | 136,949 |
| Distillate Fuel Oil | 11,546 |
| Residual Fuel Oil | 113 |
| Hydropower | 3,706 |
| Wind | 3,124 |
| Grand Total | 7,738,719 |



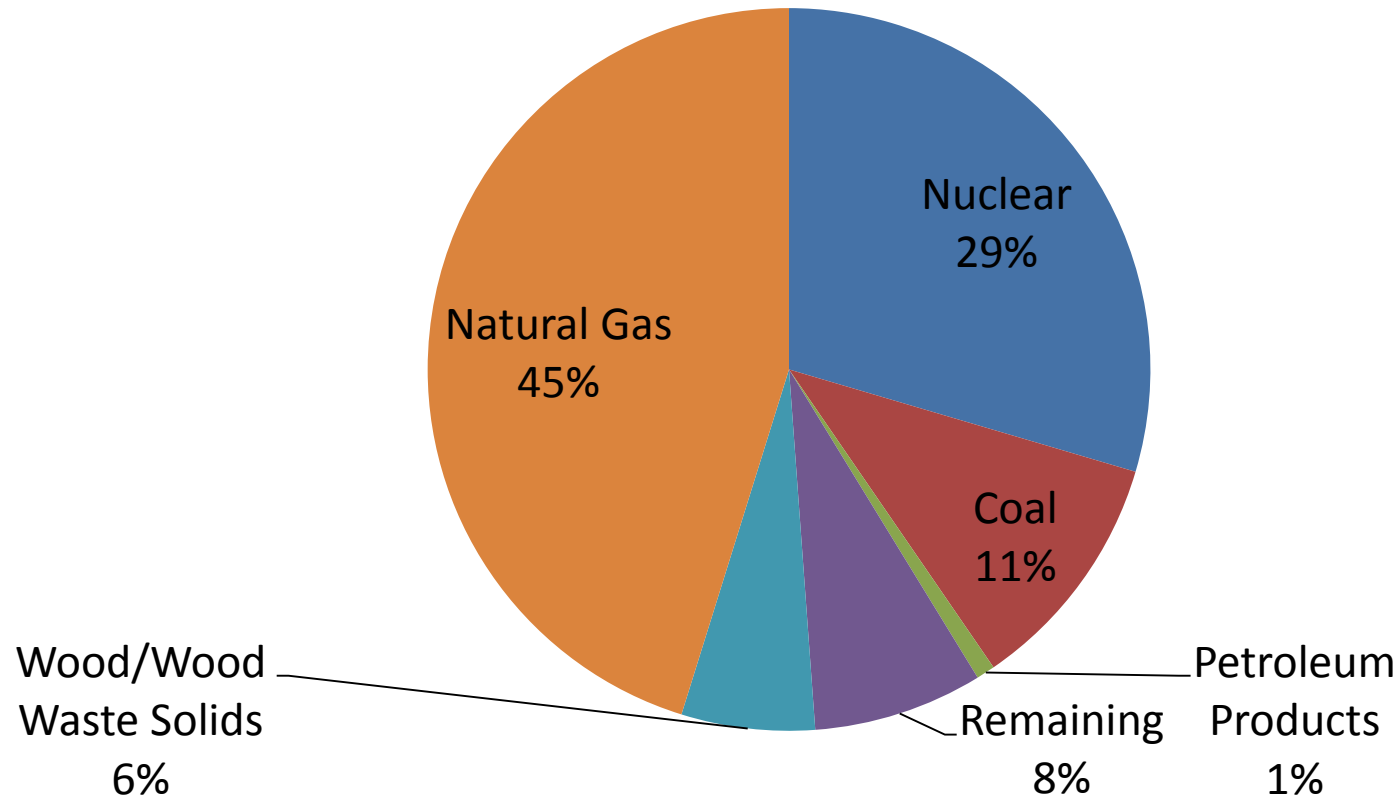
**Rhode Island
Net Generation
(MWh) - 2010**



TASK 1 - *Baseline*

Electricity: Regional Generation

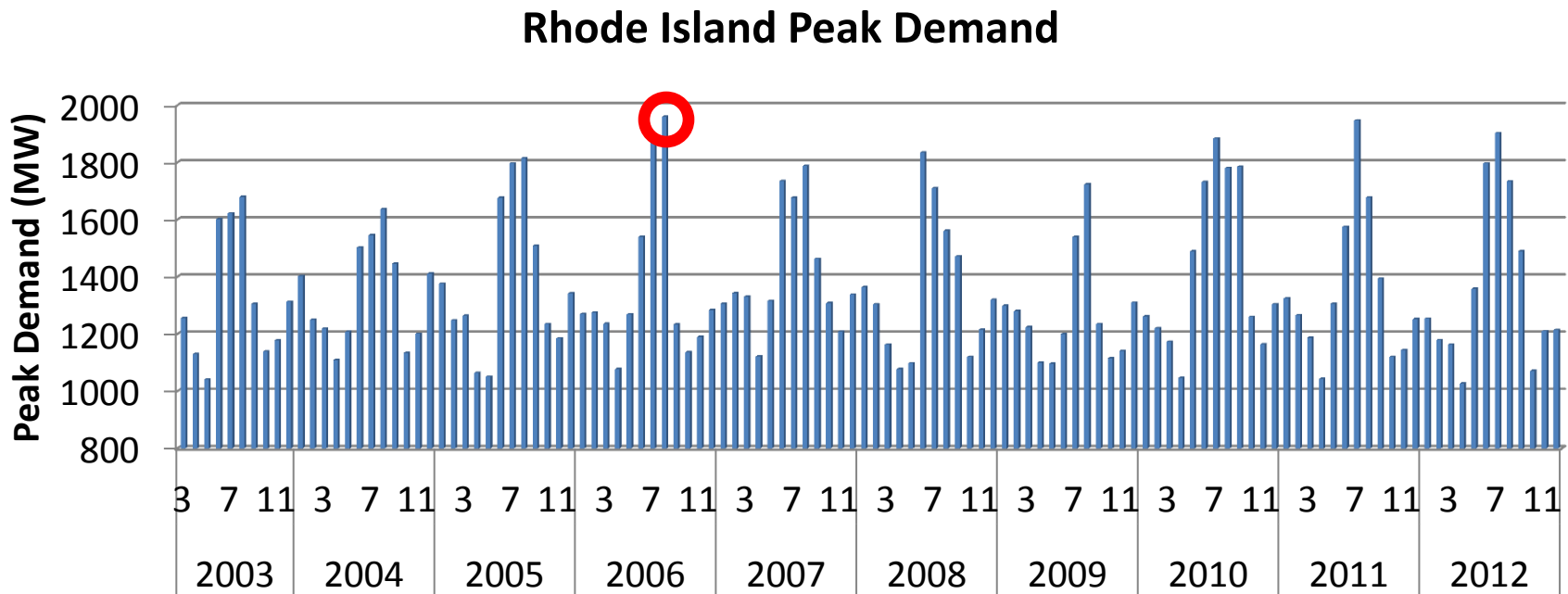
New England Net Generation (MWh) - 2010



TASK 1 - *Baseline*

Electricity: Peak Demand

- Rhode Island's record historical peak load of **1960 MW** occurred during **August 2006**



TASK 1 - *Baseline*

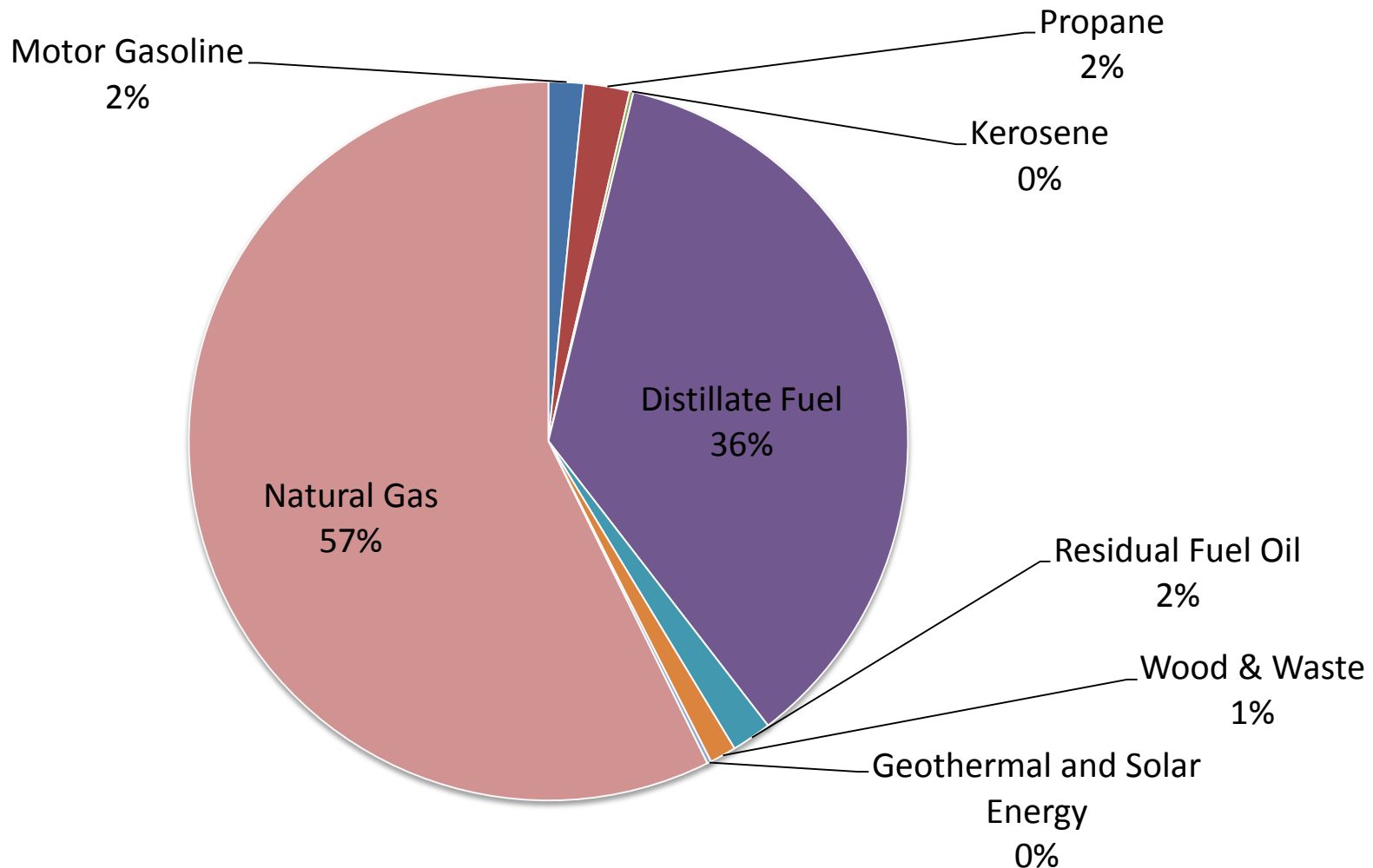
Thermal: Summary

- In **2010**, Rhode Island's thermal sector consumed **63,269 Billion BTUs** of energy. This fuel consumption cost **\$1.1 billion** and generated **3.9 million tons** of CO₂ emissions

TASK 1 - *Baseline*

Thermal: Summary

Rhode Island Thermal Consumption - 2010



TASK 1 - *Baseline*

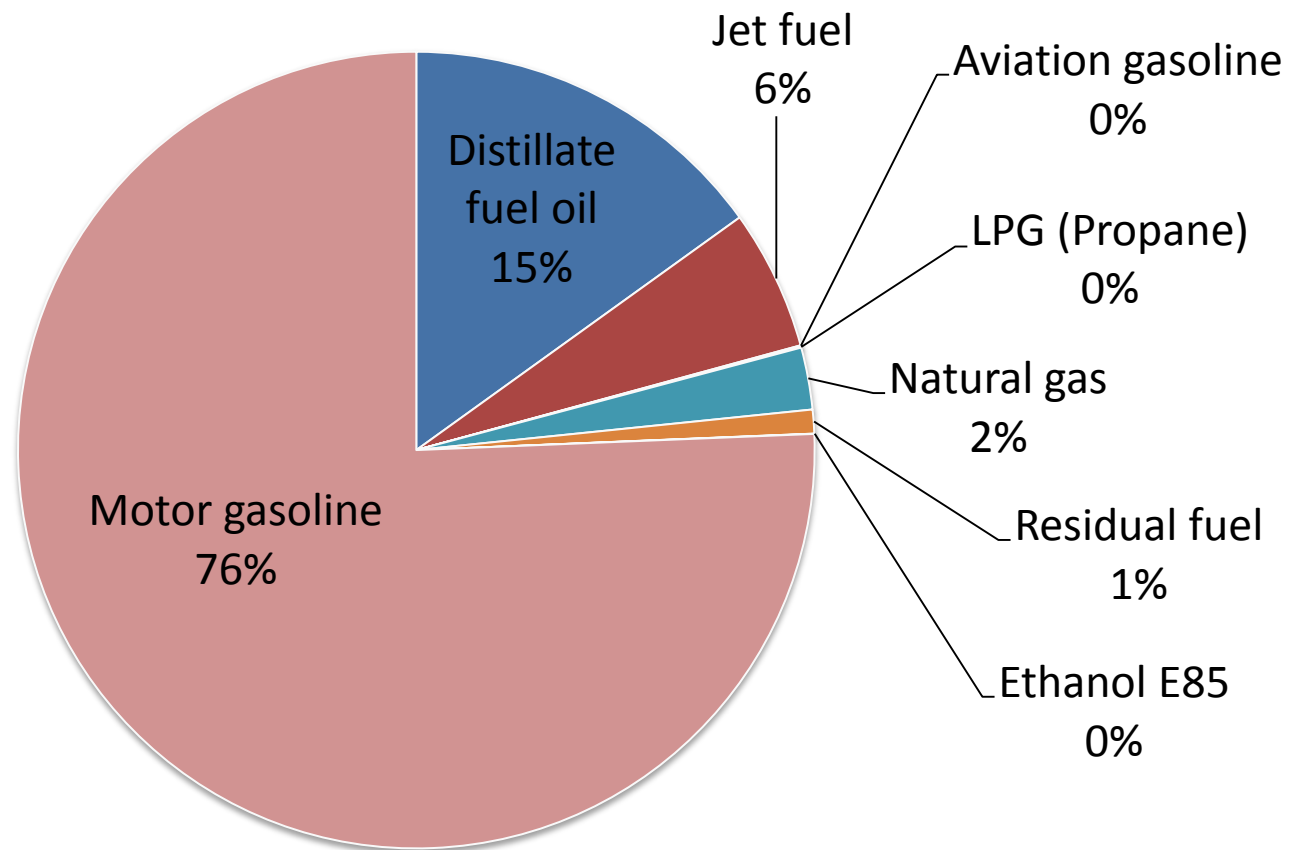
Transportation: Summary

- In **2010**, Rhode Island's transportation sector consumed **63,627 Billion BTUs** of energy. This fuel consumption cost **\$1.4 billion** and generated **4.5 million tons** of CO₂ emissions

TASK 1 - *Baseline*

Transportation: Summary

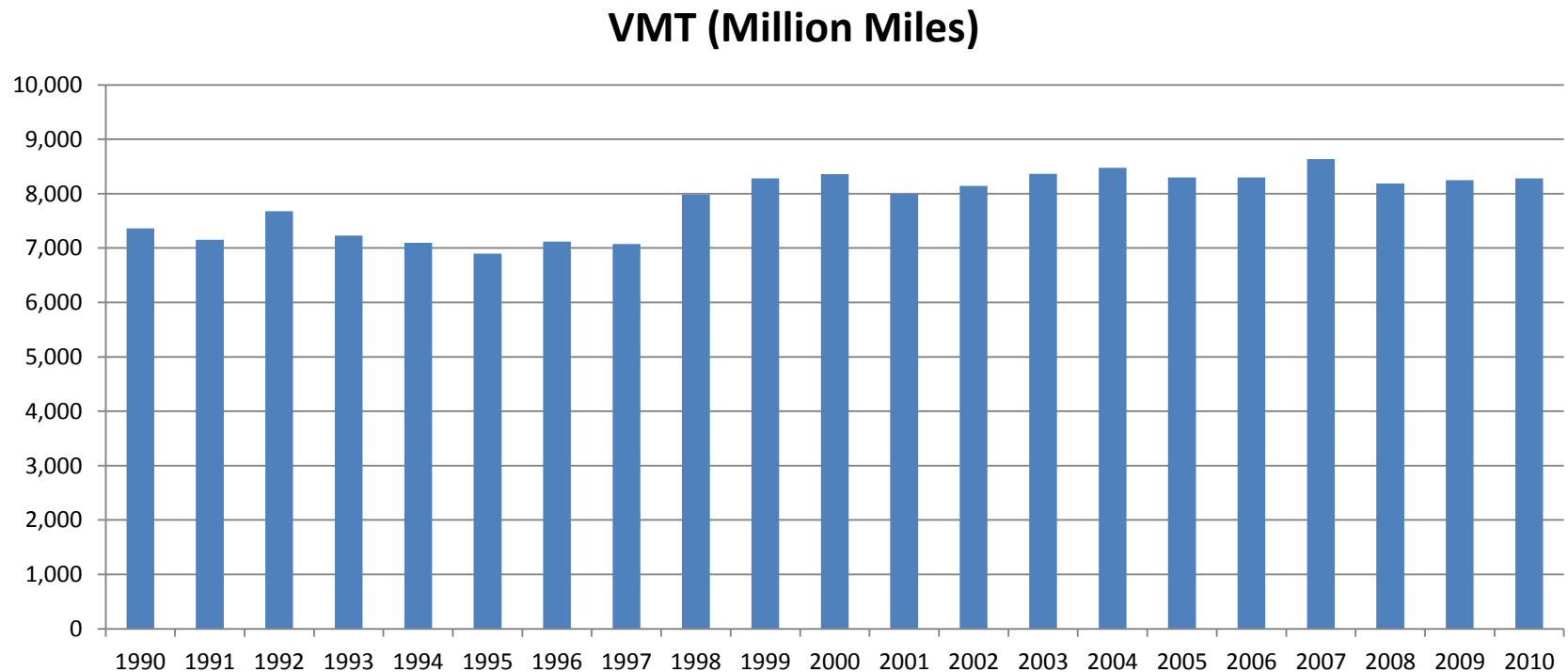
Rhode Island Transportation Consumption - 2010



TASK 1 - *Baseline*

Transportation: VMT's

- In **2010** Rhode Islanders drove **8,280,000 miles**



Preliminary Findings

TASK 2: FORECAST

RISEP Task 2 - Future State Energy Profile Report Preliminary Results

RISEP, Advisory Council Meeting

April 1, 2013

Rhode Island

Varun Kumar, Policy and Data Analyst and Jamie
Howland, Director, ENE Climate and Energy Analysis
Center (ENE CLEAN Center), Environment Northeast



National Forecasts

RISEP BAU Base Case

- This scenario is based on the AEO 2013 Early Release AEO 2013ER reference case. The AEO case was adjusted to include the impacts of increase in energy efficiency .

RISEP BAU Low Oil Price Case

- This scenario differs from the RISEP BAU Base case with a lower price for petroleum-based fuels. It is based on AEO 2012 Low Oil Price case.

RISEP BAU High Oil Price Case

- This scenario differs from the RISEP BAU Base case with a higher price for petroleum-based fuels. It uses the AEO 2012 High Oil Price case. Further, impacts of the Rhode Island Petroleum Savings and Independence Advisory Commission's recommended targets are included.

RISEP BAU Low Natural Gas Price Case

- This scenario differs from the RISEP BAU Base case with a lower price for natural gas. It uses the AEO 2012 Oil and Gas: High Technically Recoverable Resources (TRR) case.

RISEP BAU High Natural Gas price Case

- This scenario differs from the RISEP BAU Base case with a higher price for natural gas. It uses the AEO 2012 Oil and Gas: Low EUR case.

RISEP BAU Carbon Fee Case

- This scenario differs from the RISEP BAU case with an applied economy wide carbon fee starting at 15\$ and rising by 5 percent per year from 2013 through 2035.

Energy Sectors



Electricity

- Power Generation - Distillate Fuel Oil, Residual Fuel Oil, Natural Gas and Coal.
- Electricity consumption - Residential, Commercial, Transportation and Industrial.



Thermal

- Residential – Propane, Distillate Fuel Oil (heating oil), Kerosene and Natural Gas.
- Commercial - Propane, Distillate Fuel Oil, Residual Fuel Oil, Kerosene and Natural Gas.
- Industrial - Propane, Distillate Fuel Oil, Residual Fuel Oil, Natural Gas and Coal.



Transportation

- Propane, Distillate Fuel, Motor Gasoline, Jet Fuel, Residual Fuel Oil, E85 and Natural Gas.

Rhode Island State Energy Plan National Data Forecast

National Data Forecasts

Reference Case

High Natural Gas Price Case

Low Natural Gas Price Case

Low Oil Price Case

Carbon Fee

High Oil Price Case

For each forecast, Rhode Island energy consumption, price, expenditure and emissions future data derived using historical data from EIA and New England specific future data from EIA Annual Energy Outlook (AEO)

Data is forecasted from 2011-2035. Year 2011 and 2012 actual data is used wherever available.

Refer to Task 2 datalist for list of forecasted parameters

For High Oil Price Case Only - The Rhode Island Petroleum Savings and Independence Advisory Commission proposed targets are analyzed

Further analysis is required to analyze the impacts of reductions on non petroleum fuels.

Each forecast is adjusted to include the impacts of Federal, Regional and Rhode Island's existing policies

Rhode Island Comprehensive Energy Conservation, Efficiency and Affordability Act

Electric Efficiency - Impacts on electric generation, consumption, emissions, price and expenditure

Natural Gas Efficiency - Impacts on gas consumption, emissions, and expenditure

Renewable Portfolio Standards - Impacts already included in the EIA AEO data used for the analysis

Federal Light Duty Vehicle CAFE Standards - Impacts already included in the EIA AEO data

Regional Green House Gas Initiative New Cap

Impacts on power plant emissions

Impacts on power plant fossil fuel consumption

Impacts on electricity price

DATA SOURCES AND ANALYSIS METHODOLOGY

Forecast Model Input Data

- Baseline data is from Energy Information Administration (EIA) State Energy Data System (SEDS).
- Projected data from :
 - ✓ EIA Annual Energy Outlook (AEO) -
 - ❖ EIA AEO 2013 ER Reference Case – New England specific data through 2040.
 - ❖ EIA AEO 2012 Alternative Cases – New England specific data through 2035.

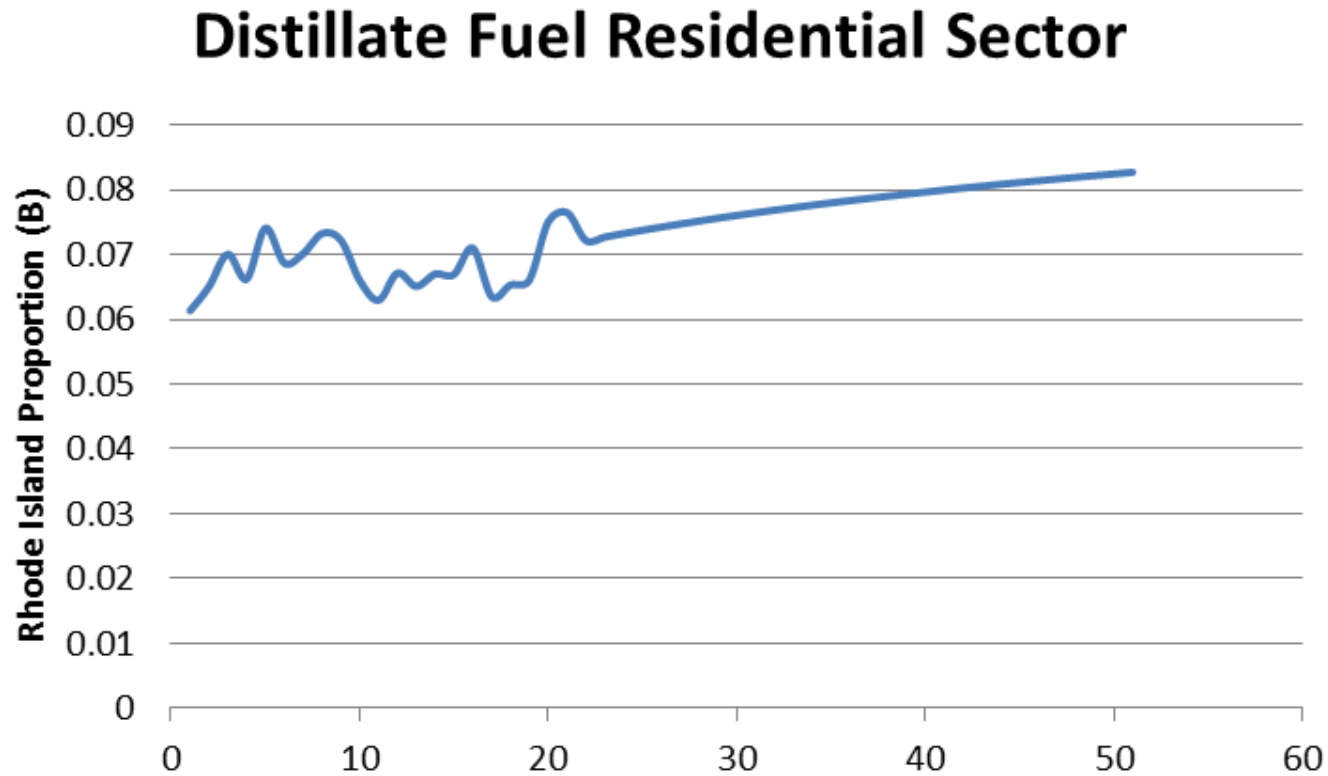
Derivation of Rhode Island Results Based on EIA AEO New England Data

- EIA AEO results are region specific and are available in aggregated form for New England.
- Rhode Island specific results were derived by analyzing historical relationship between region and the state.
- Key parameters used to analyze relationship are historical proportions (B):
- $B1 = \text{Rhode Island Consumption} / \text{New England Consumption}$.
- $B2 = \text{Rhode Island Price} / \text{New England Price}$.

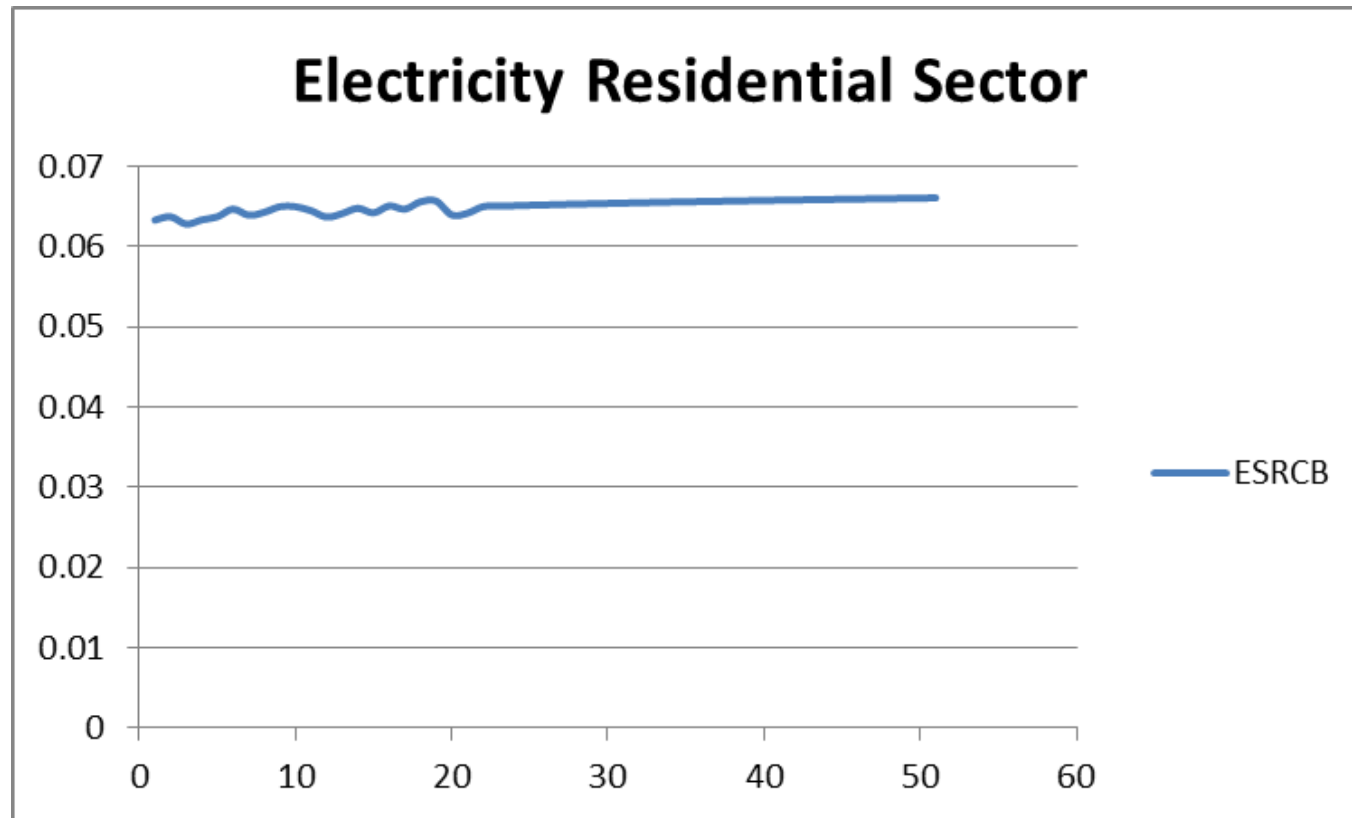
Derivation of Rhode Island Results Based on EIA AEO – Fuel Consumption Parameter B Data

- For fuel consumption parameter B was forecasted using historic time series data.
- Considering future uncertainty regarding changes in Rhode Island demand compared to New England we made a conservative assumption that existing trends will stabilize and used logarithmic trend line.
- Logarithmic trend line is suitable to capture recent trends which stabilizes in future.

Some of the consumption historical proportion (B1) trends



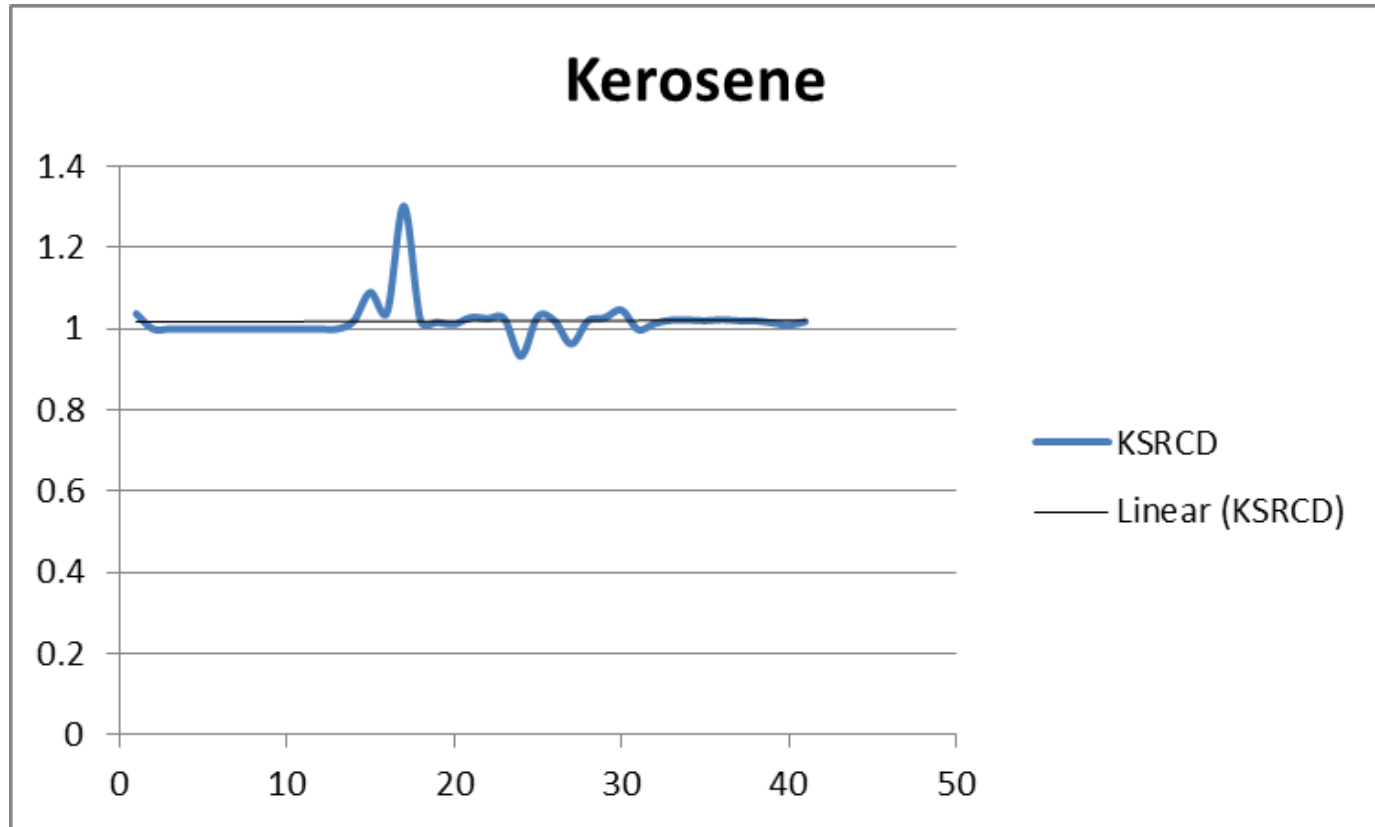
Some of the consumption historical proportion (B1) trends



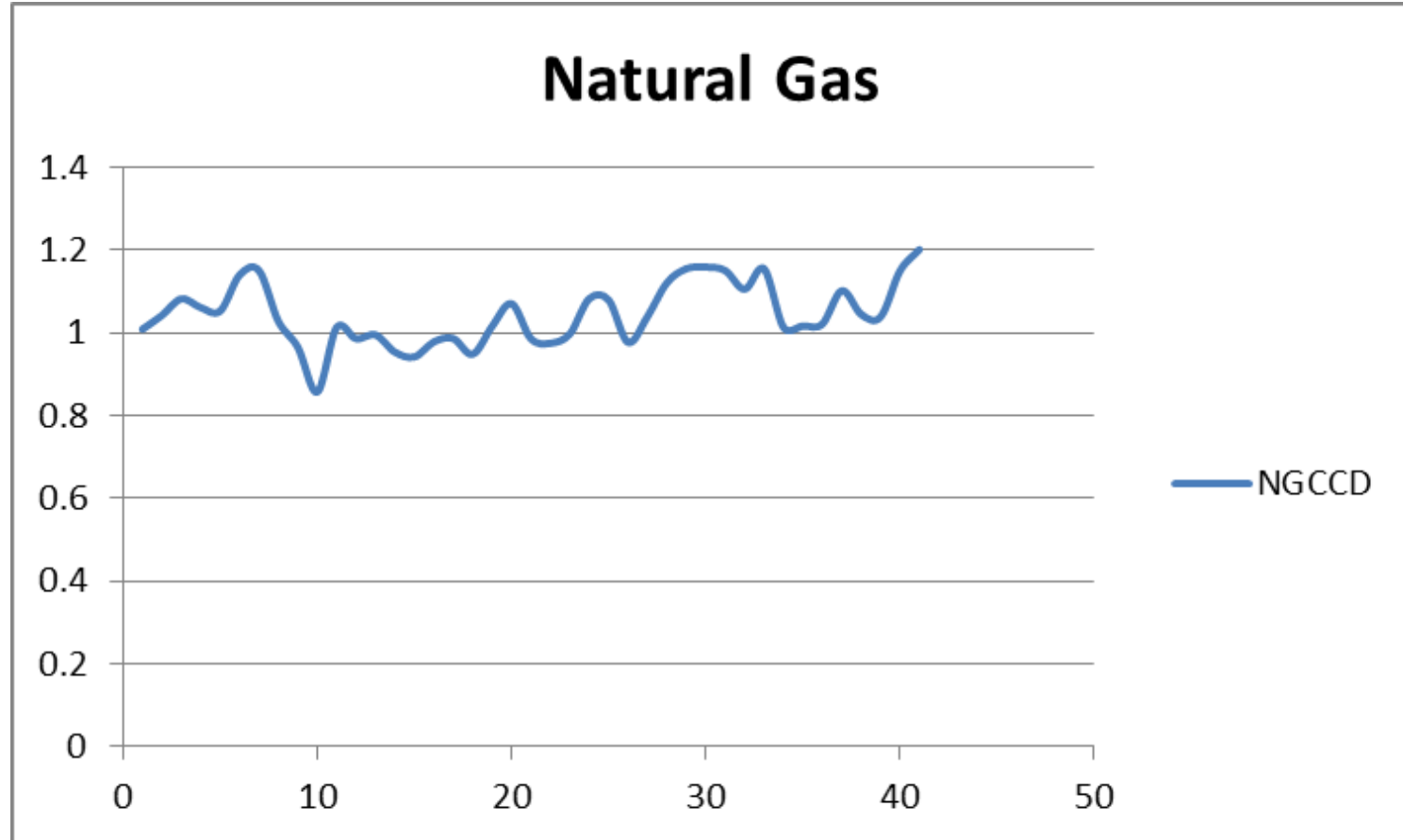
Derivation of Rhode Island Results Based on EIA AEO – Fuel Price Data

- For price parameter B2 data was random and without historical trends

Some of the price historical proportion (B2) trends



Some of the price historical proportion (B2) trends



Continued....

- Rhode Island specific Energy Price and Consumption is derived by applying forecasted B1 and B2 on New England Data
- Energy expenditure is derived using consumption and price data.
- Greenhouse gas emissions are derived using consumption and emission factors data.

Policy Impacts- Energy Efficiency

- Results derived from the AEO were adjusted by the impacts of increased energy efficiency based on assumed savings targets.
- Electricity and Natural Gas consumption and price was adjusted for residential and commercial sector.
- Electricity Generation was adjusted for Fossil Fuels based Power Plants.
- Price suppression impact or Demand Reduction Induced Price Impact (DRIPE) was included while evaluating electricity price impact using National Grid Energy Efficiency Plan Data.

Electric Efficiency

| Year | Electric Efficiency Savings Target (Percentage of Sales) | Source |
|-----------|--|--|
| 2012 | 1.7% | RI Energy Efficiency Procurement Plan 2012-14 |
| 2013 | 2.1% | |
| 2014 | 2.5% | |
| 2015-2021 | 2.7% | ENE proposed based on KEMA RI Energy Efficiency Opportunity Report |
| 2022-2024 | 2% | ENE proposed conservative estimate based on anticipated new opportunity. |
| 2025-2035 | 1.5% | |

Natural Gas Efficiency

| Year | Natural Gas Efficiency Savings Target (Percentage of Sales) | Source |
|-----------|---|---|
| 2012 | 0.6% | RI Energy Efficiency Procurement Plan 2012-14 |
| 2013 | 0.8% | |
| 2014 | 1% | |
| 2015-2017 | 1% | ENE proposed based on VEIC Optimal Consultant Team RI Opportunity Report. |
| 2018-2020 | 1% | ENE proposed conservative estimate based on anticipated new opportunity. |
| 2021-2035 | 0.5% | |

Regional Green House Initiative (RGGI)

New Cap

- Following parameters were adjusted:
 - Natural gas power generation consumption
 - Electricity energy and capacity price
- RGGI Inc. IPM model forecasted old and new cap differences were used to evaluate impacts
- Above mentioned parameters were adjusted.

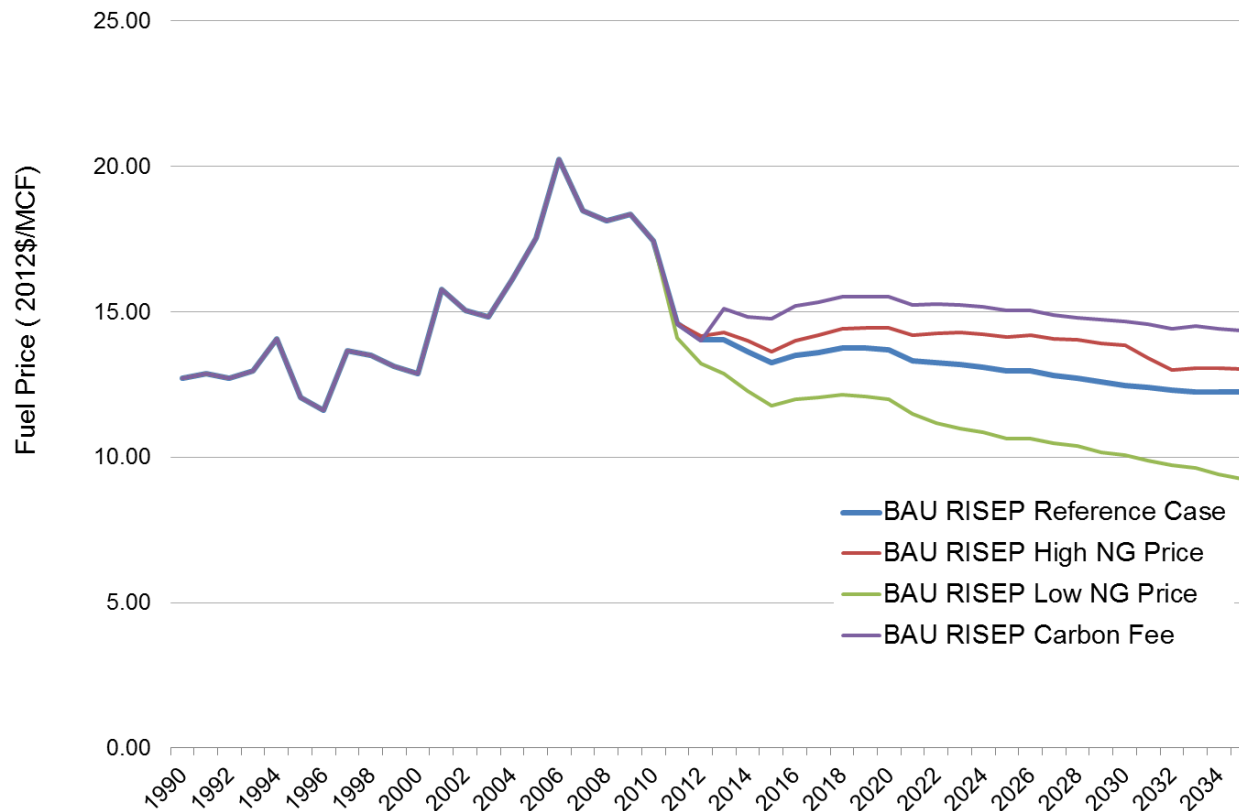
Petroleum Voluntary Target Analysis

Methodology For High Oil Price Case

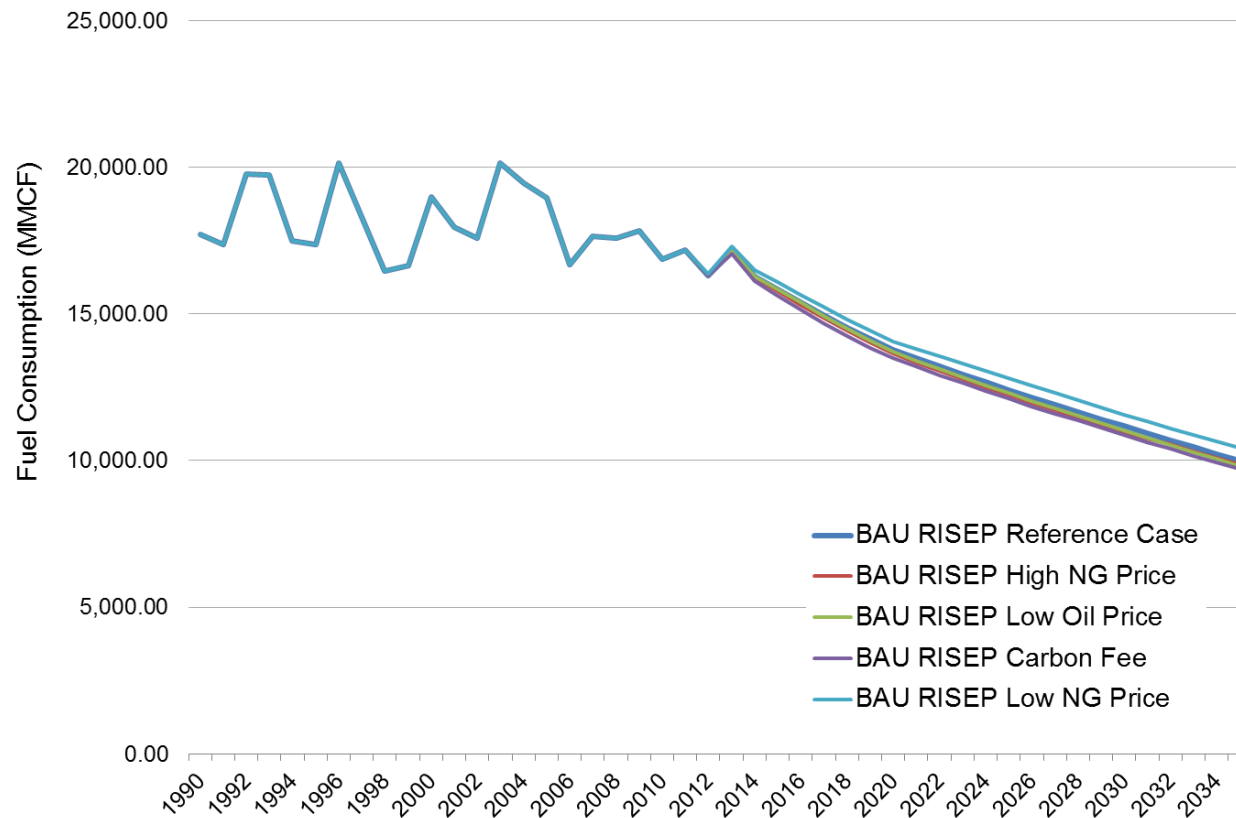
- Petroleum target for 2030 was found to be met for the results of High Oil Price case
- Required reductions to achieve 2050 target were annually distributed.
- Reductions till 2035 were derived by adjusting forecasted key petroleum products consumption values with required yearly reductions to meet the 2050 target.

SUMMARY RESULTS

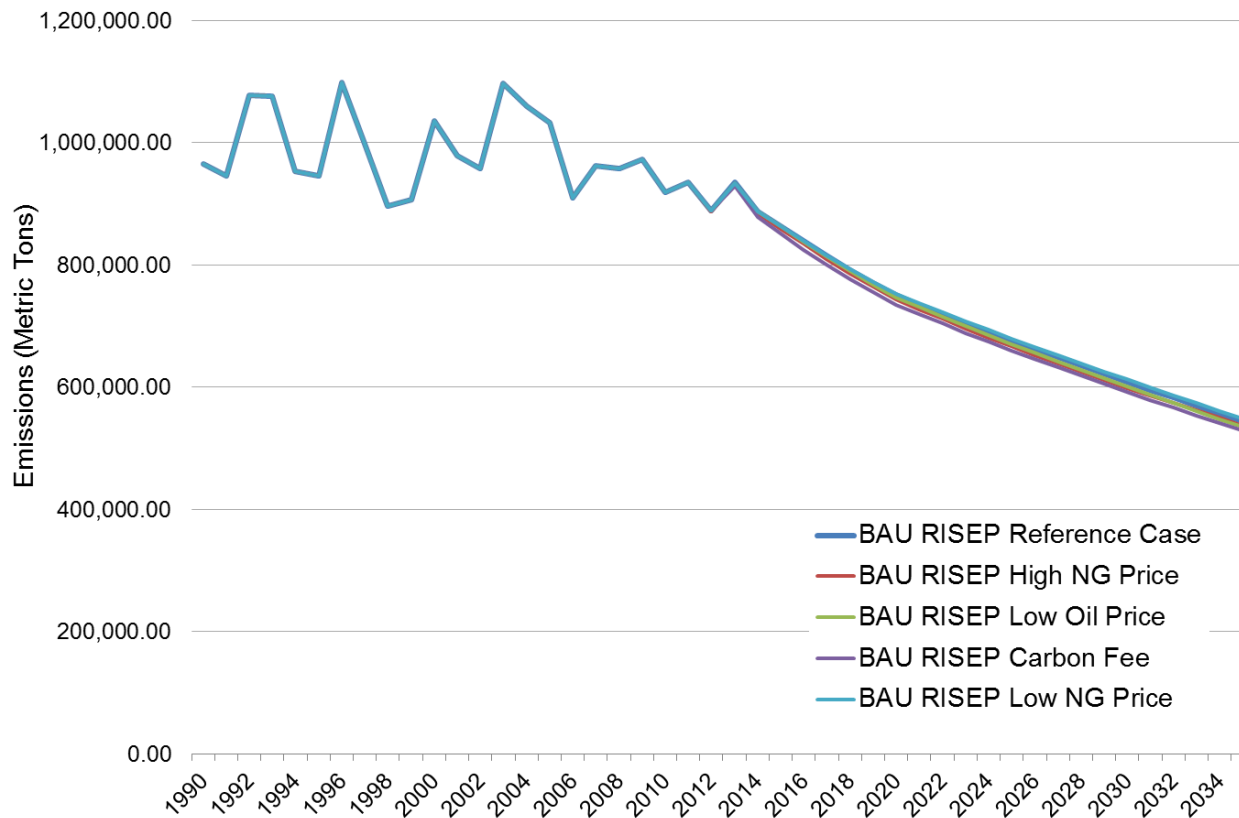
Thermal Sector – Residential Sector Natural Gas Prices



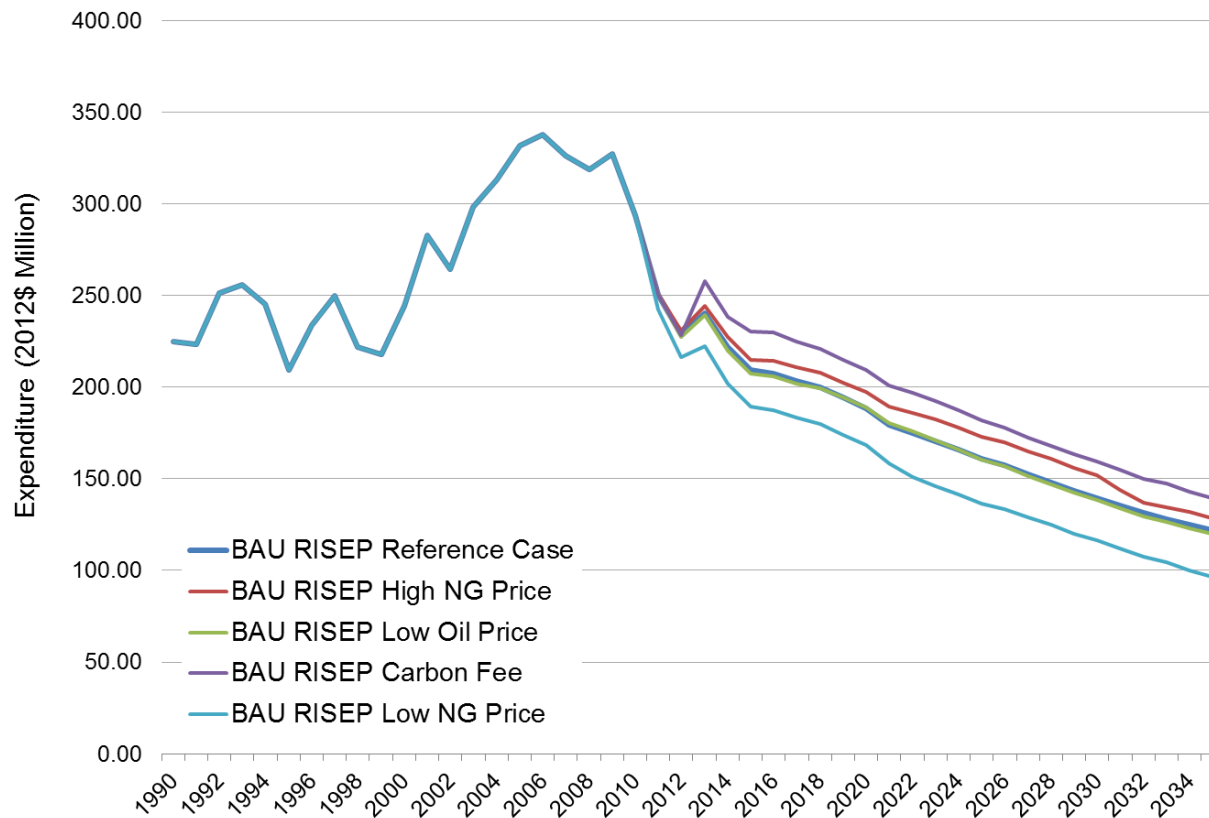
Thermal Sector – Residential Sector Natural Gas Consumption – Shows NG Efficiency Impact



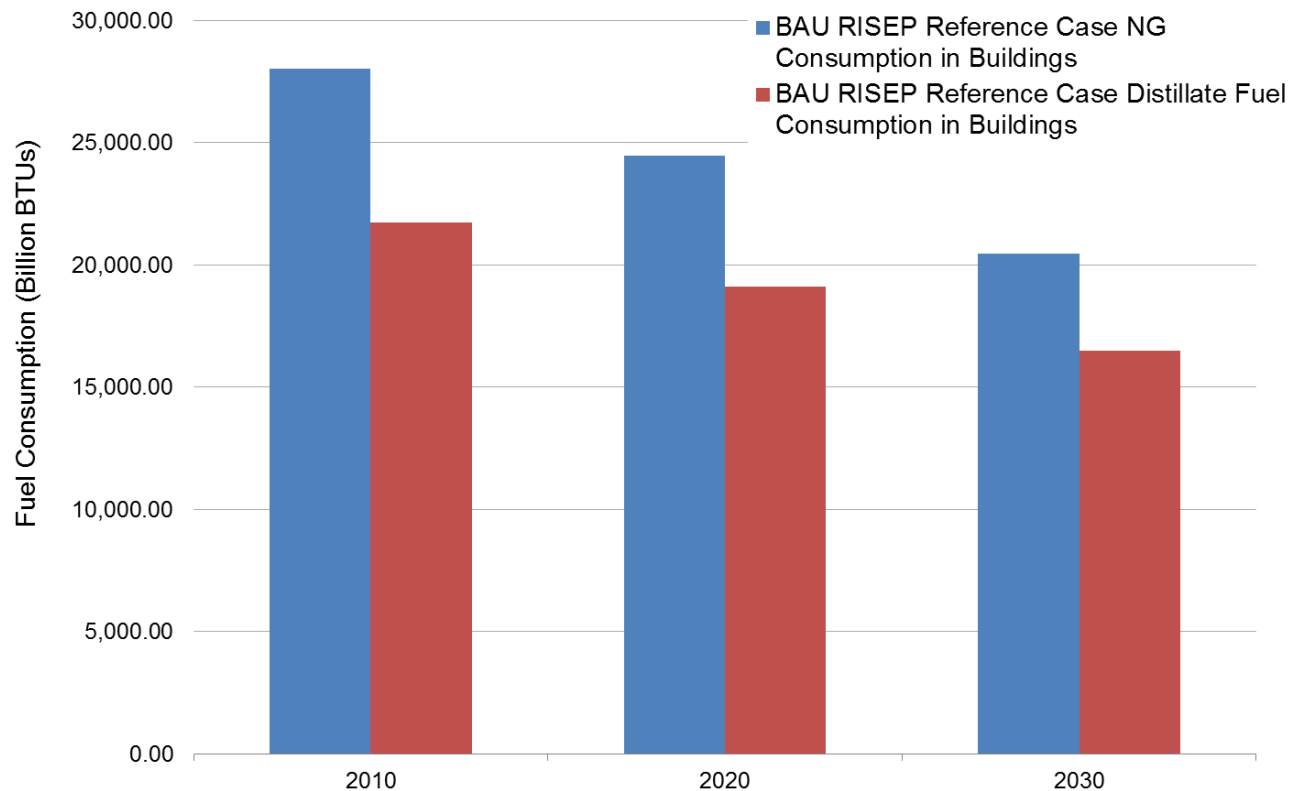
Thermal Sector - Residential Sector Natural Gas Emissions



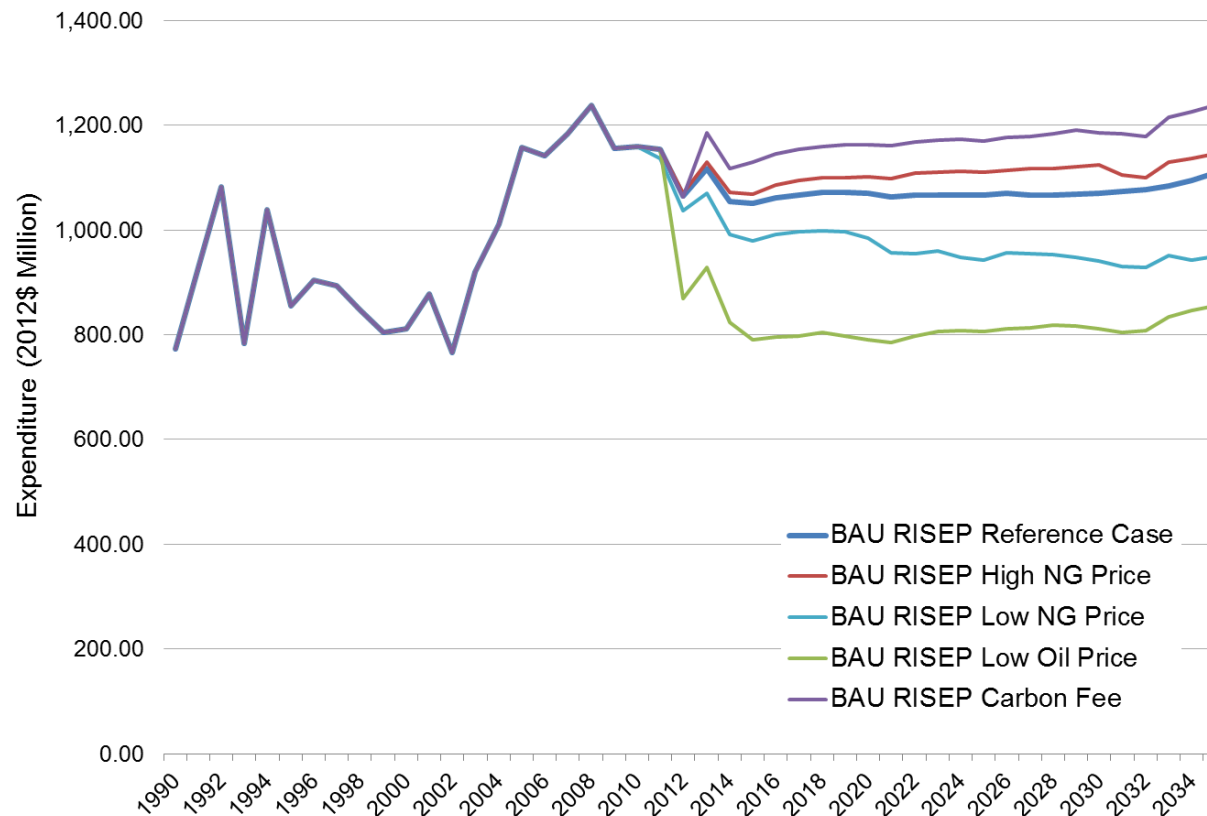
Thermal Sector - Residential Sector Natural Gas Expenditure



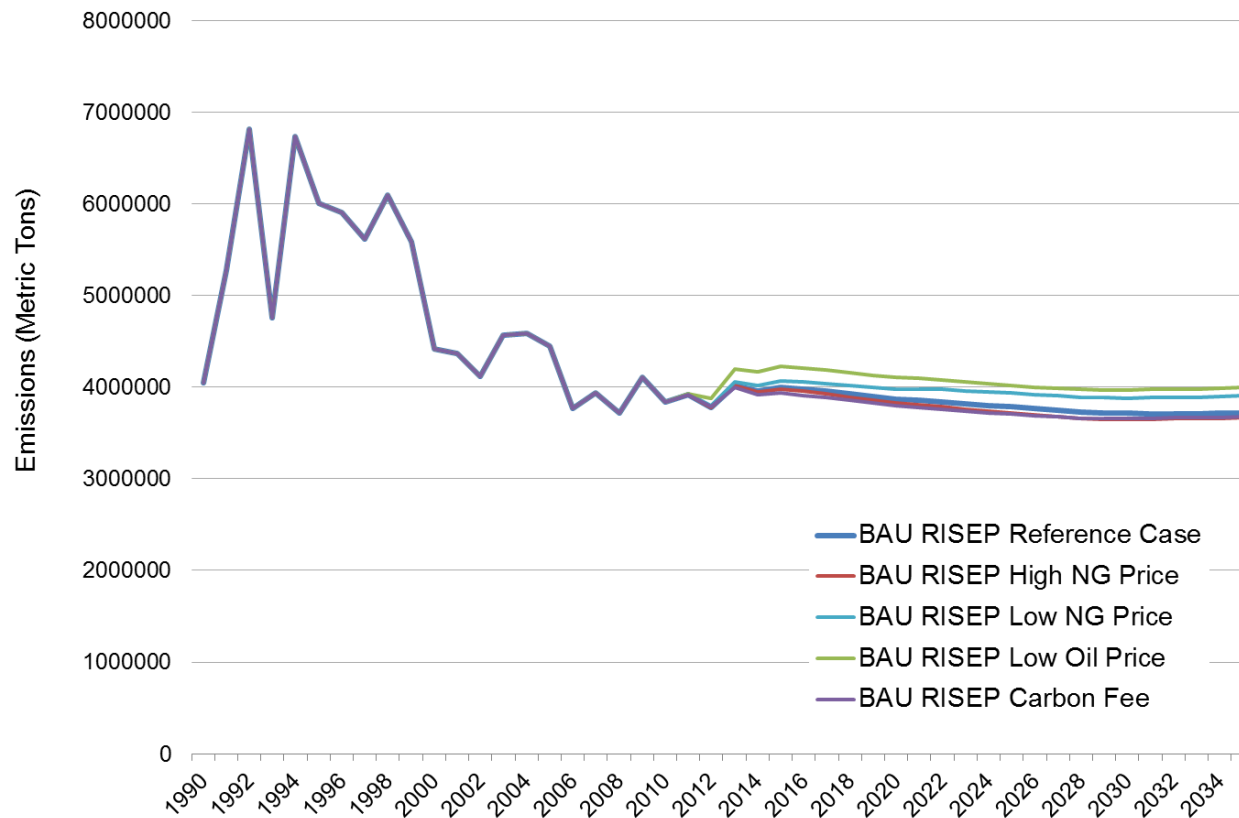
Natural Gas vs Distillate Fuel in Rhode Island Buildings



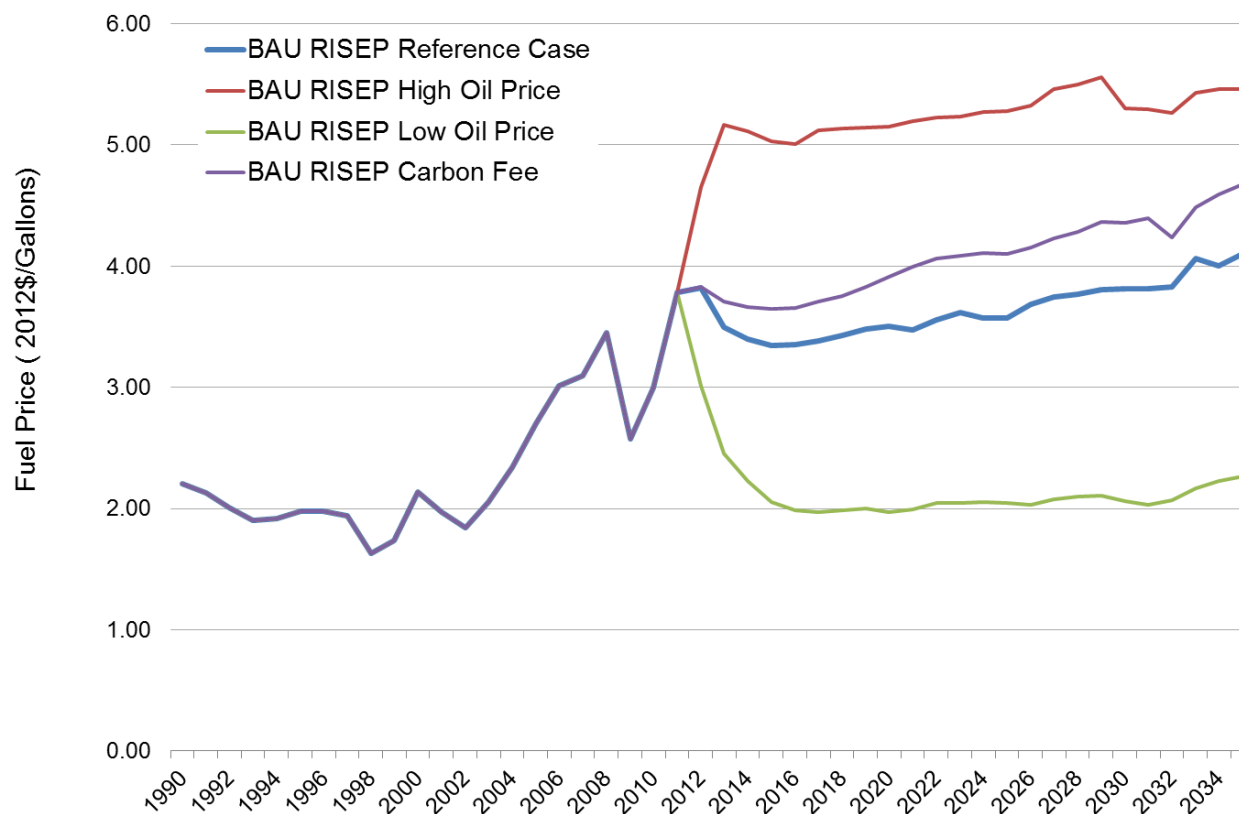
Thermal Sector Total Expenditure For Analyzed Fuels



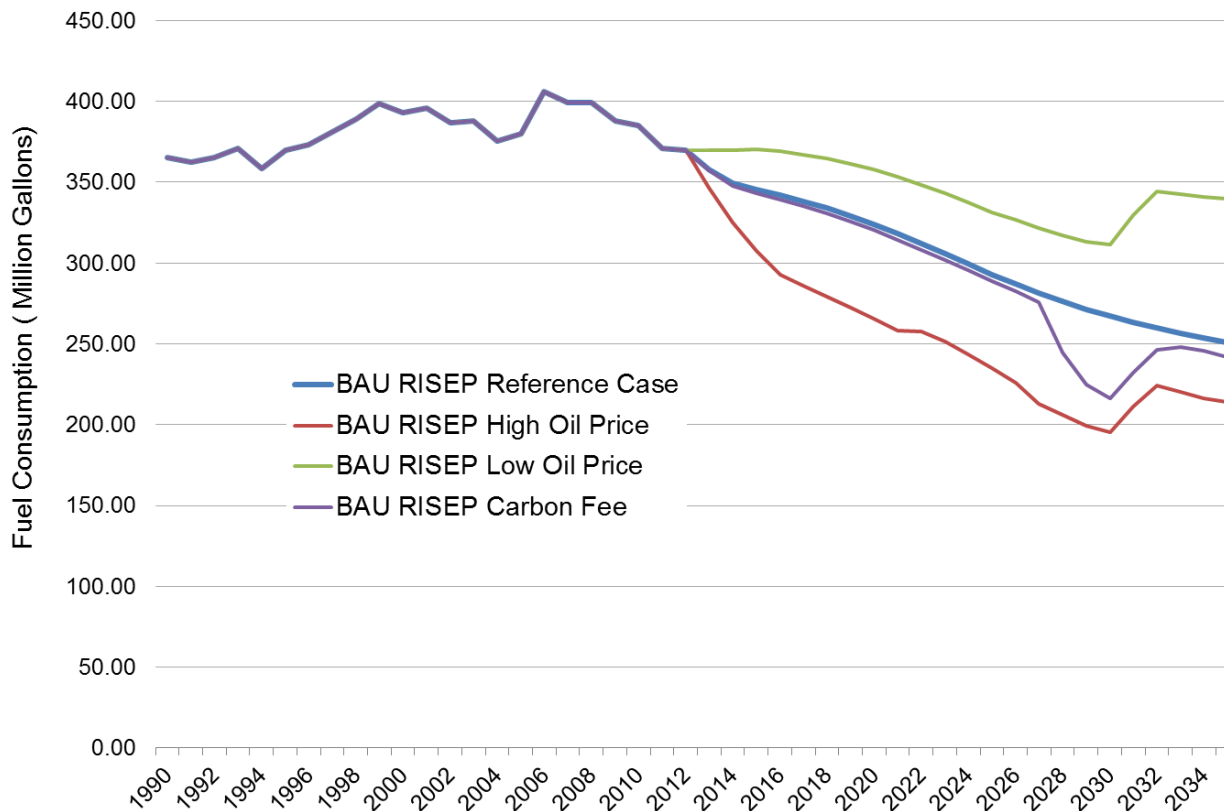
Thermal Sector Total Emissions For Analyzed Fuels



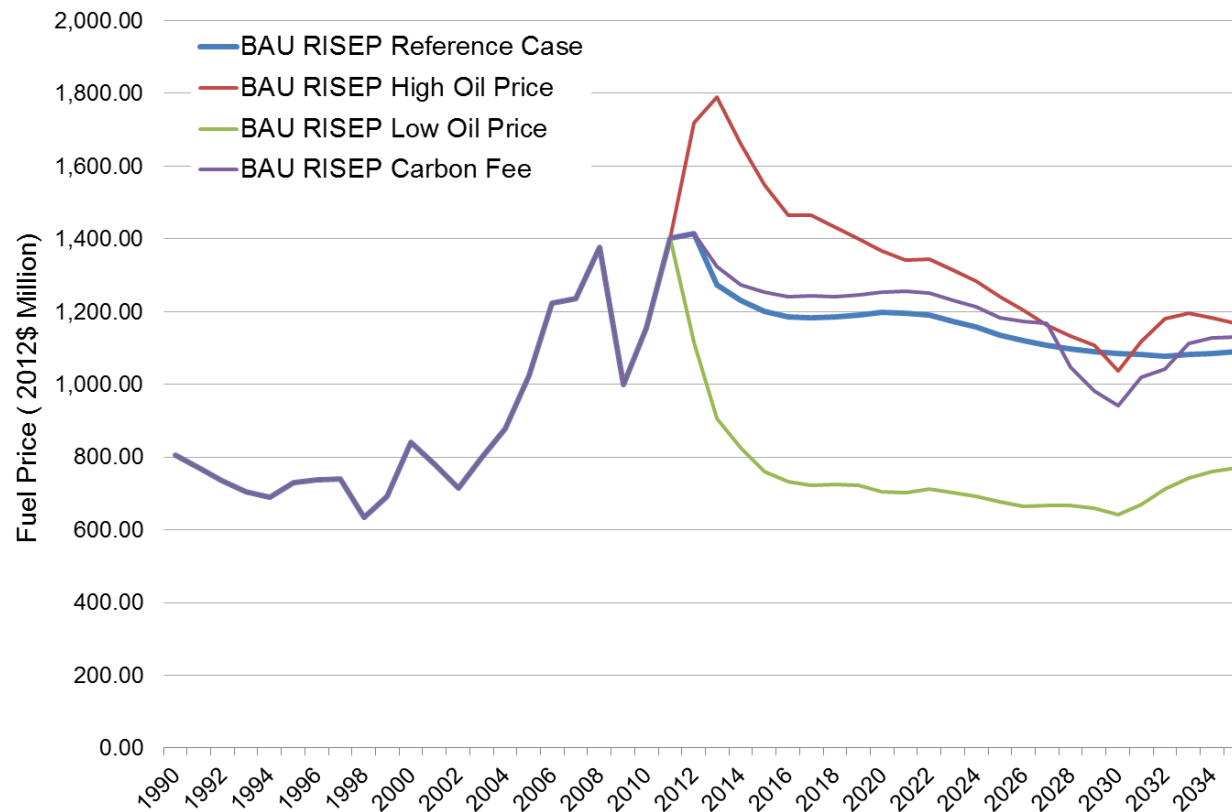
Transportation Sector –Gasoline Prices



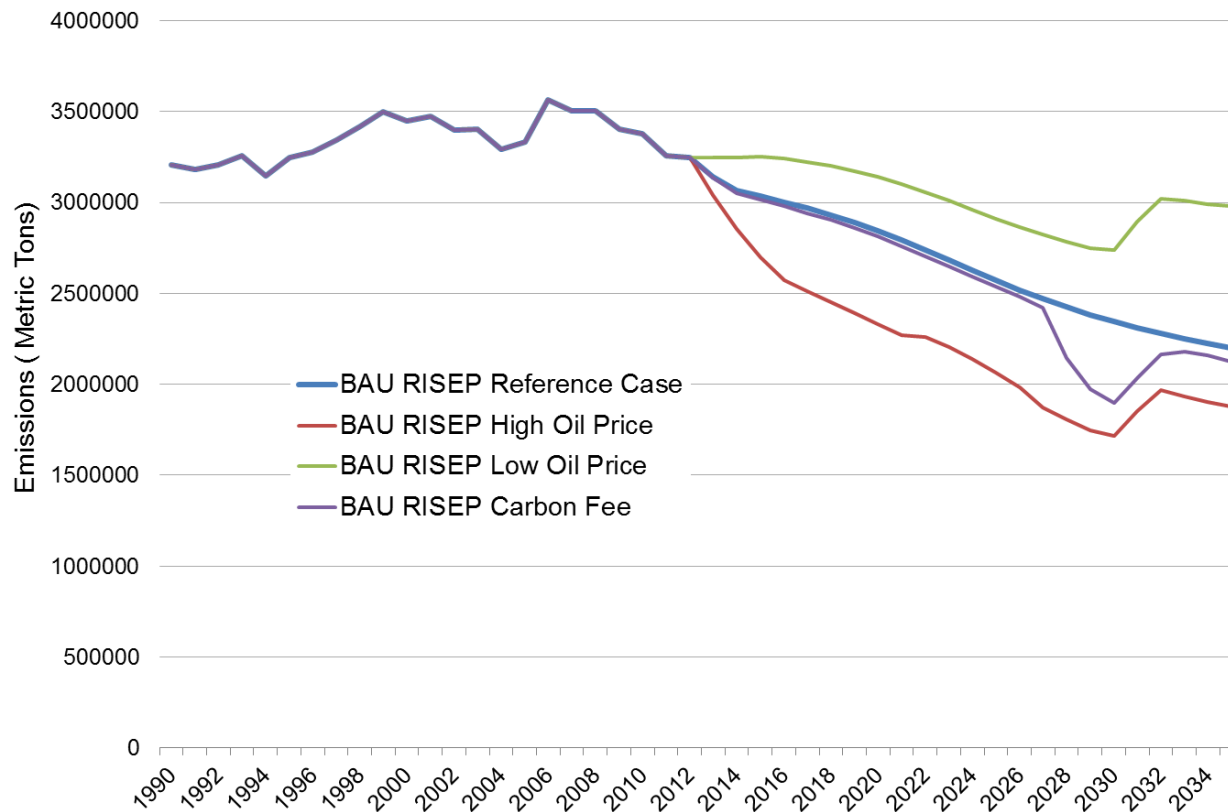
Transportation Sector –Gasoline Consumption (Shows Impact of CAFÉ)



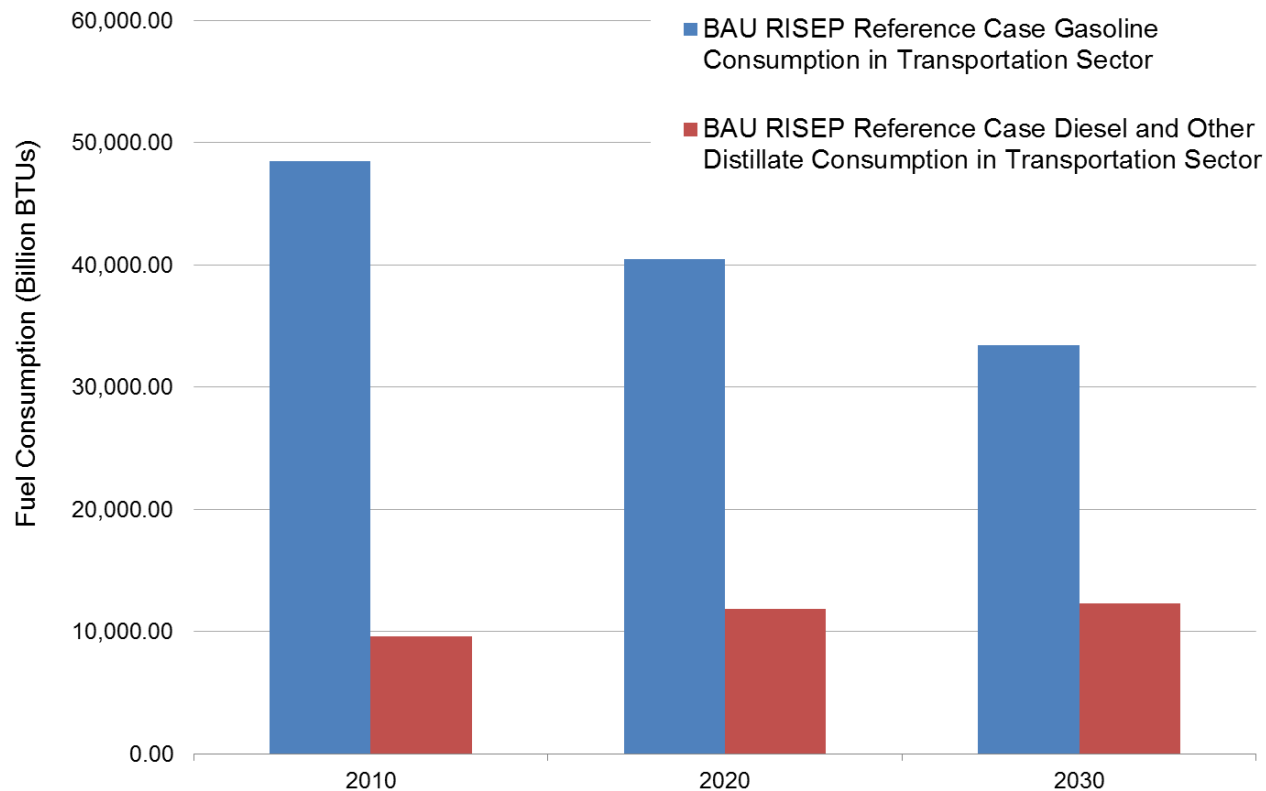
Transportation Sector –Gasoline Expenditure



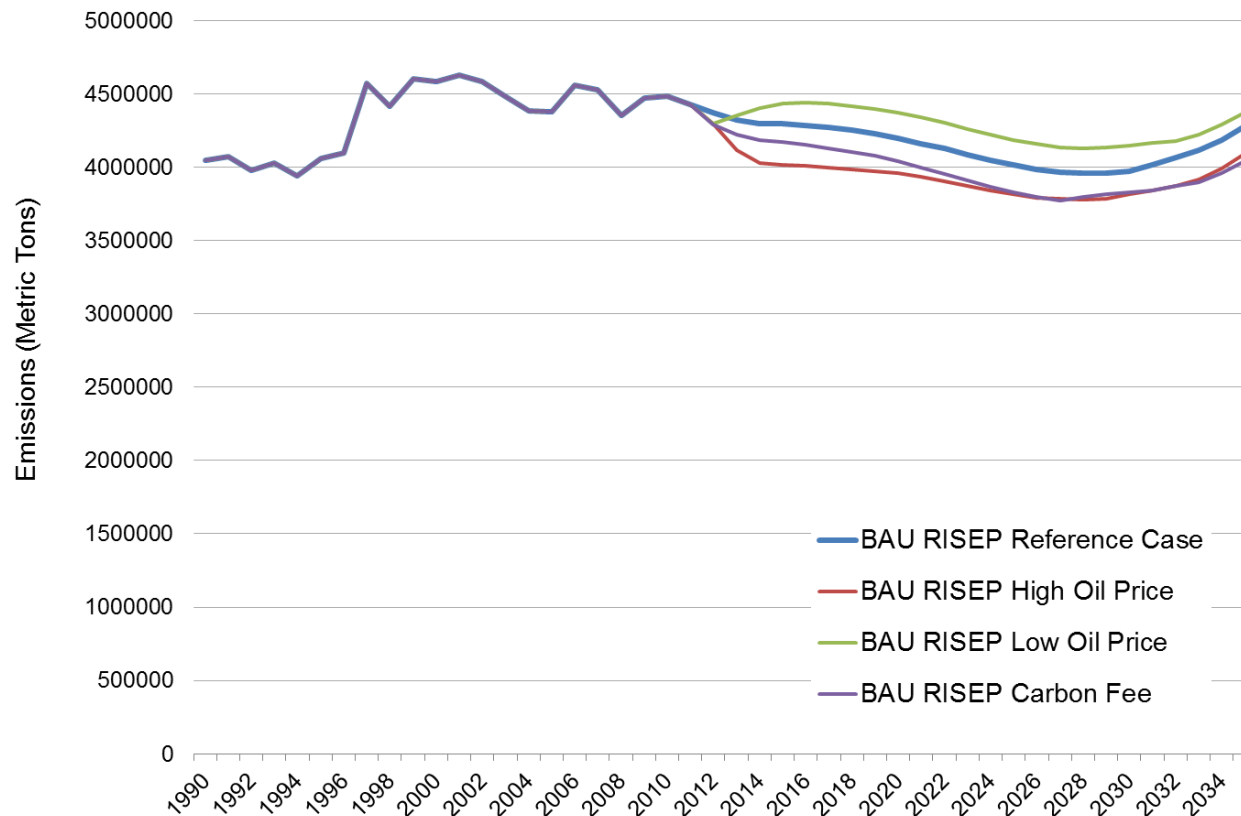
Transportation Sector –Gasoline Emissions



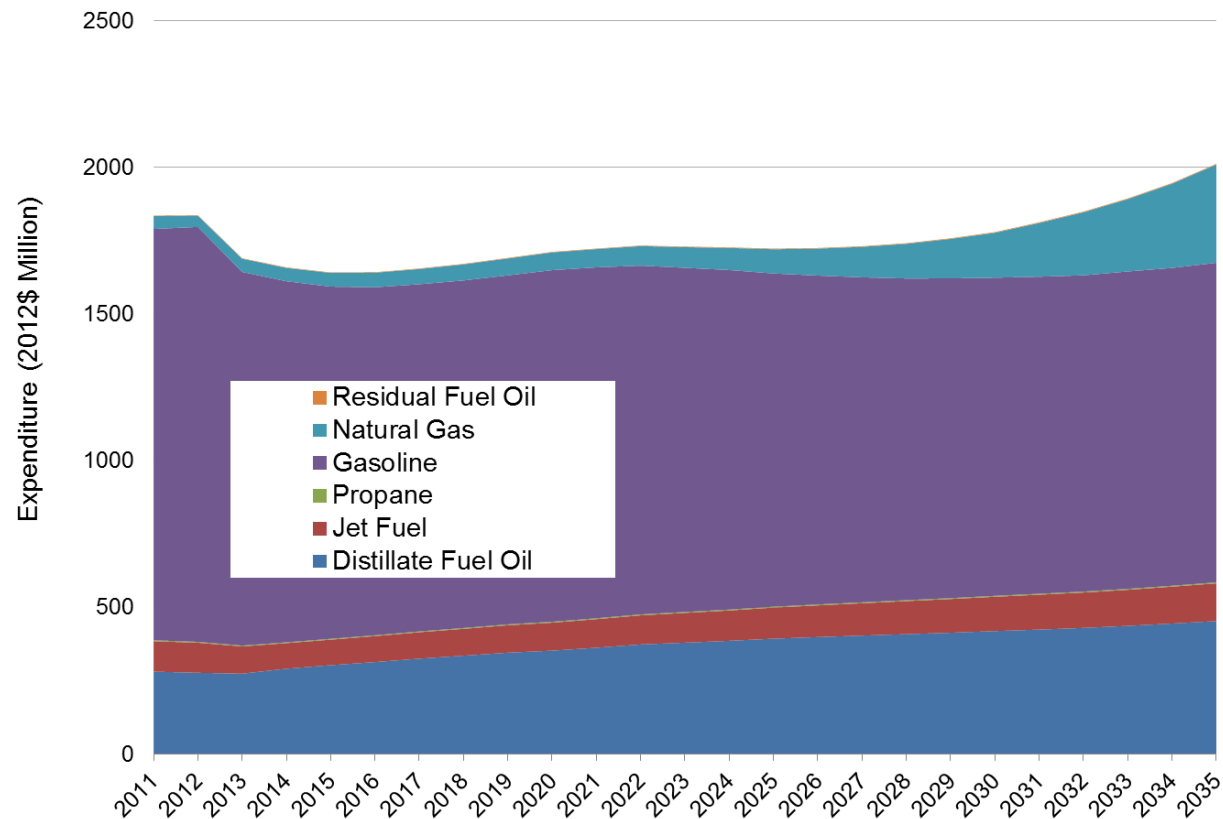
Gasoline vs Diesel and Other Distillate Consumption in Transportation Sector



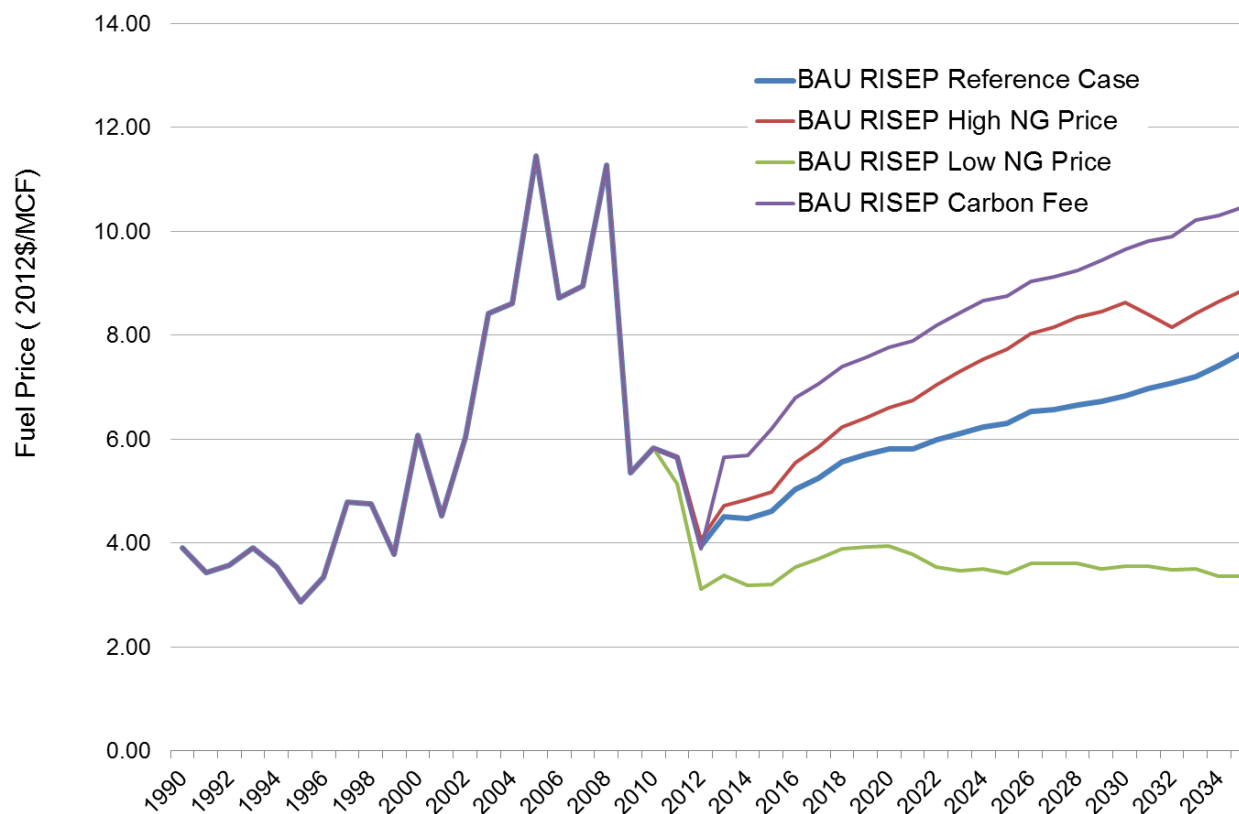
Transportation Sector Total Emissions For Analyzed Fuels



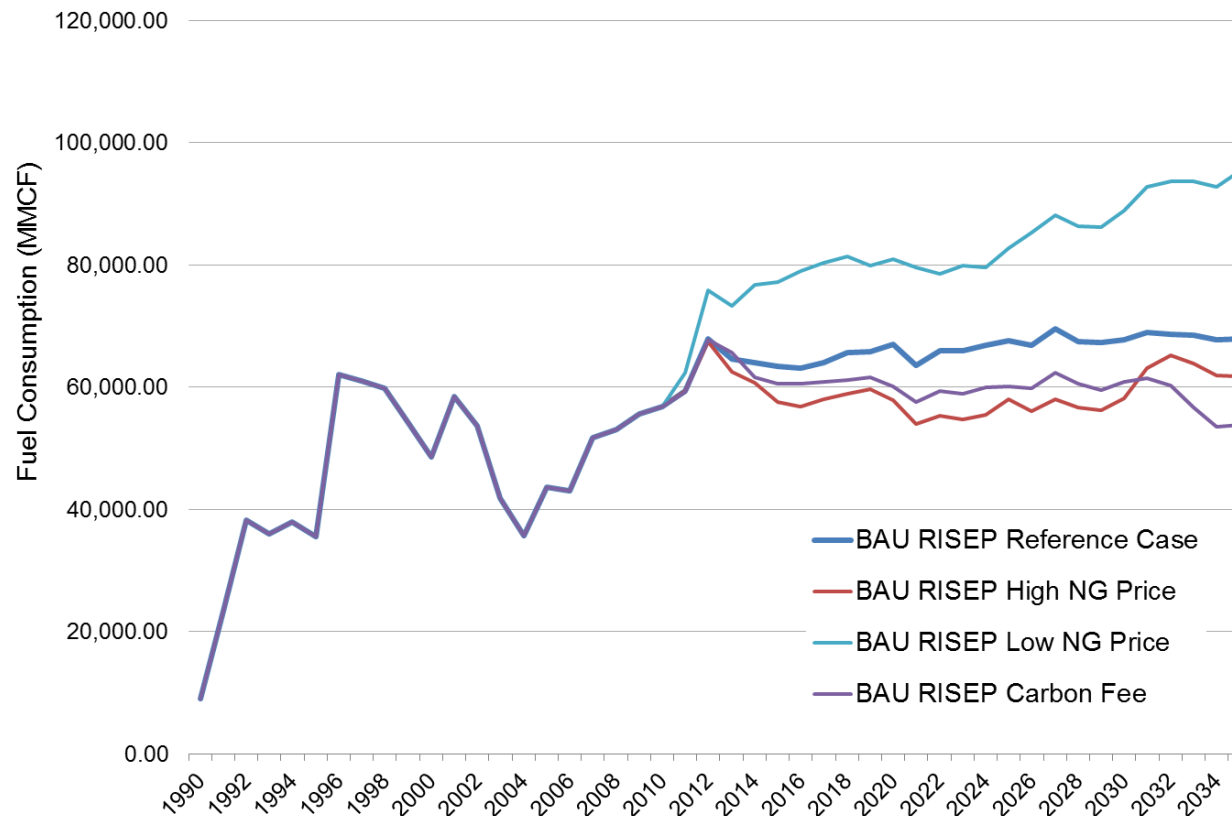
Transportation Sector Total Expenditure For Analyzed Fuels



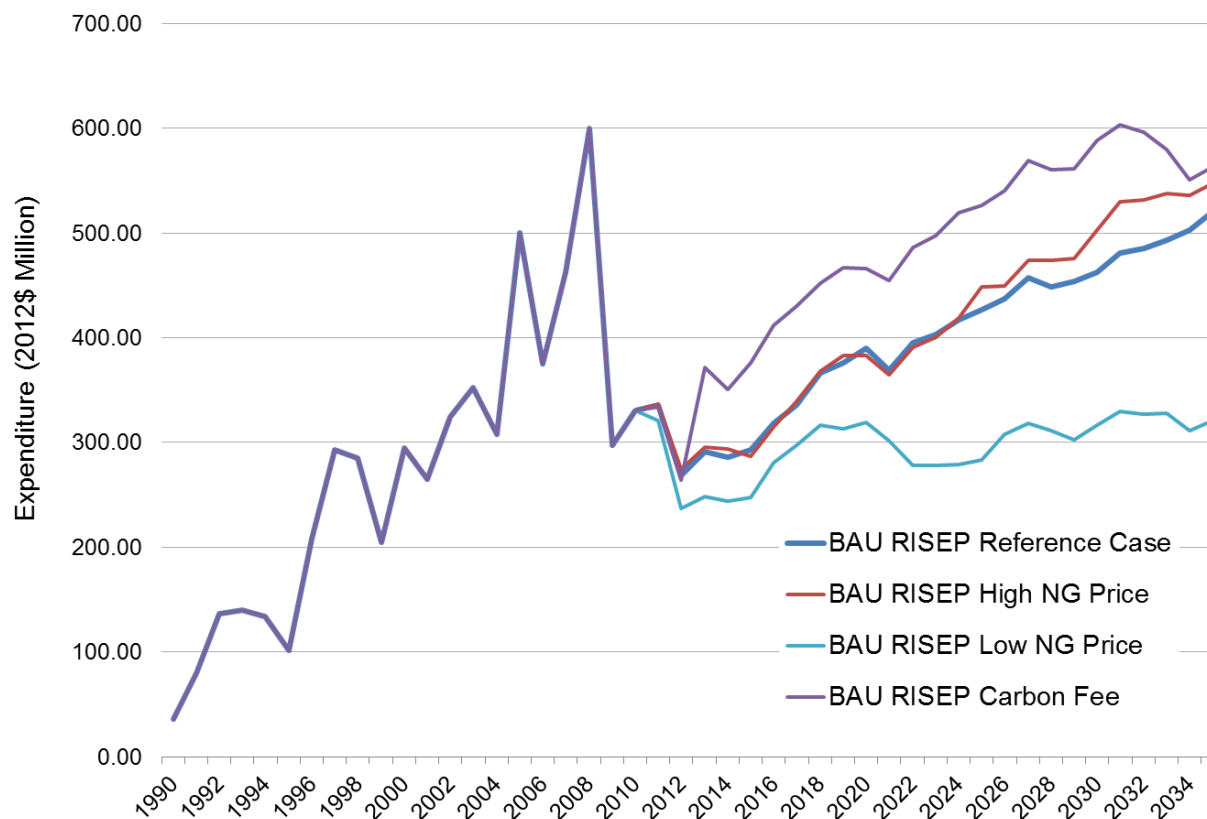
Electricity Sector – Natural Gas Price



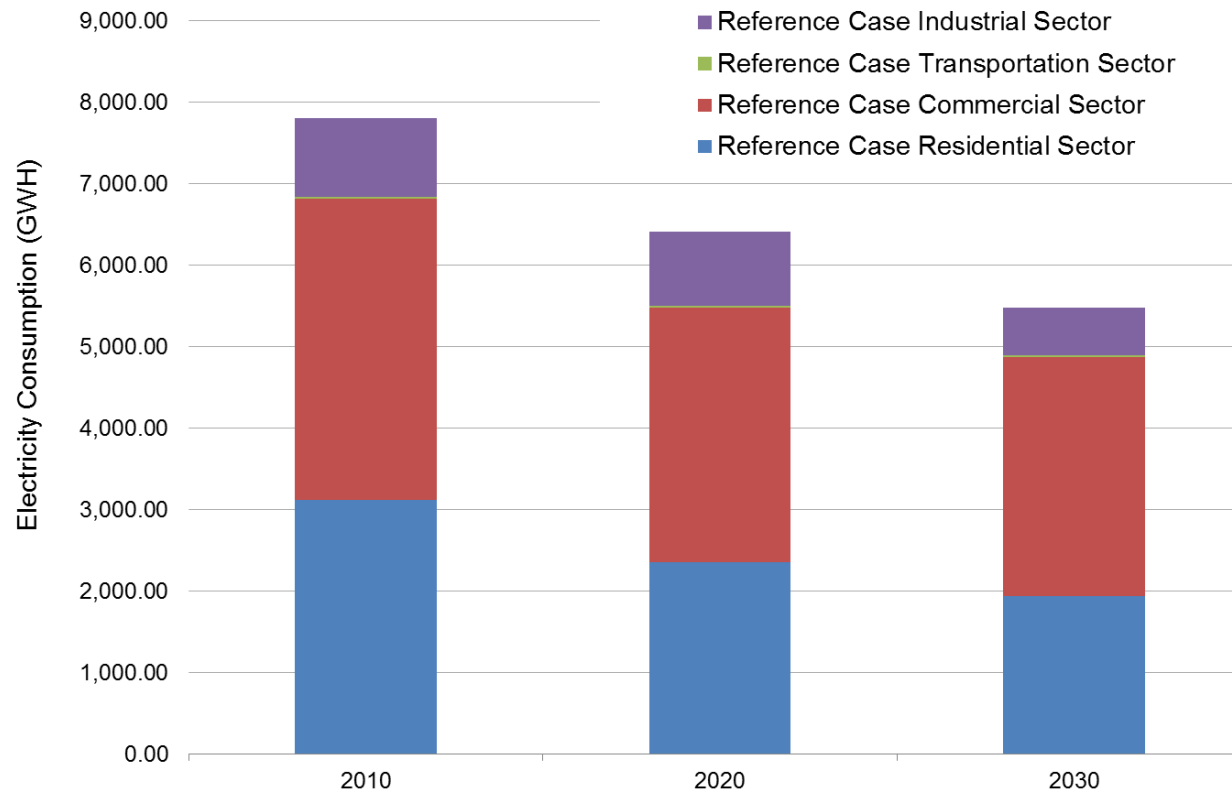
Electricity Sector – Natural Gas Consumption (Shows RGGI Impact)



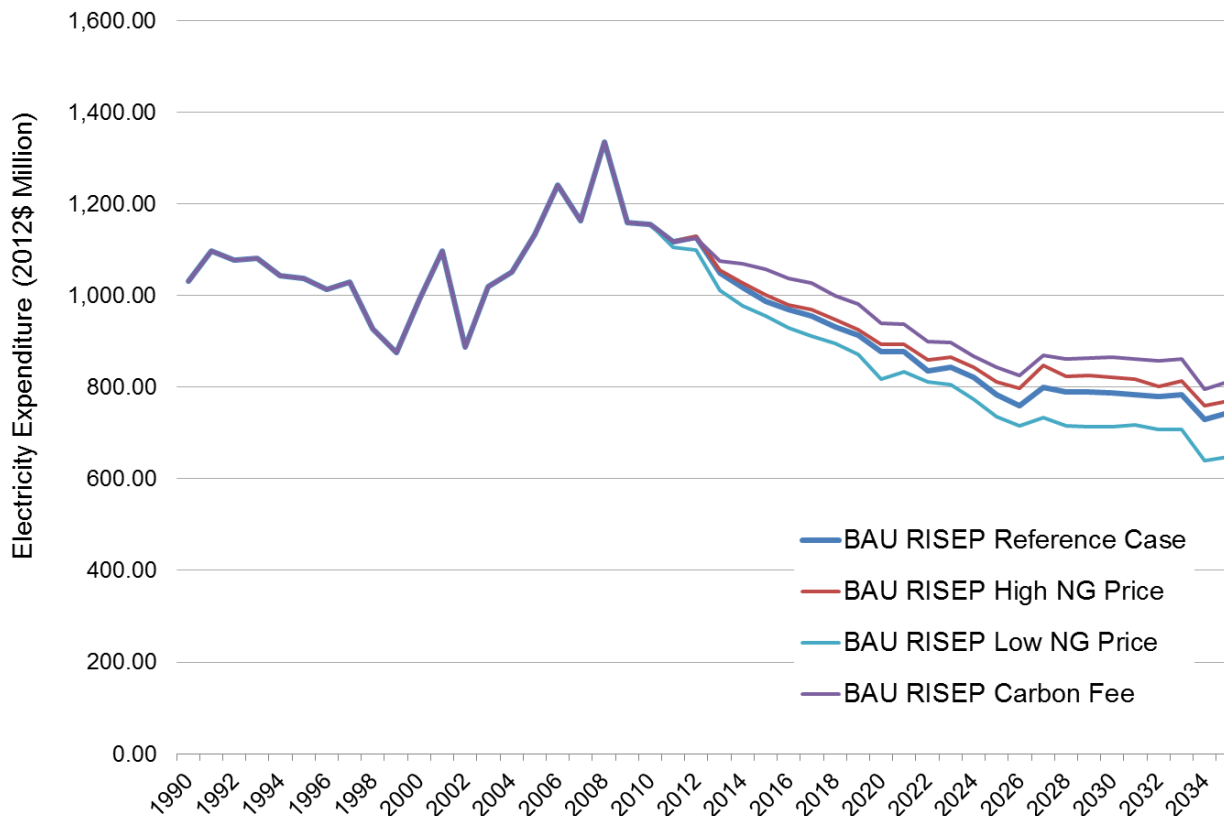
Electricity Sector – Natural Gas Expenditure



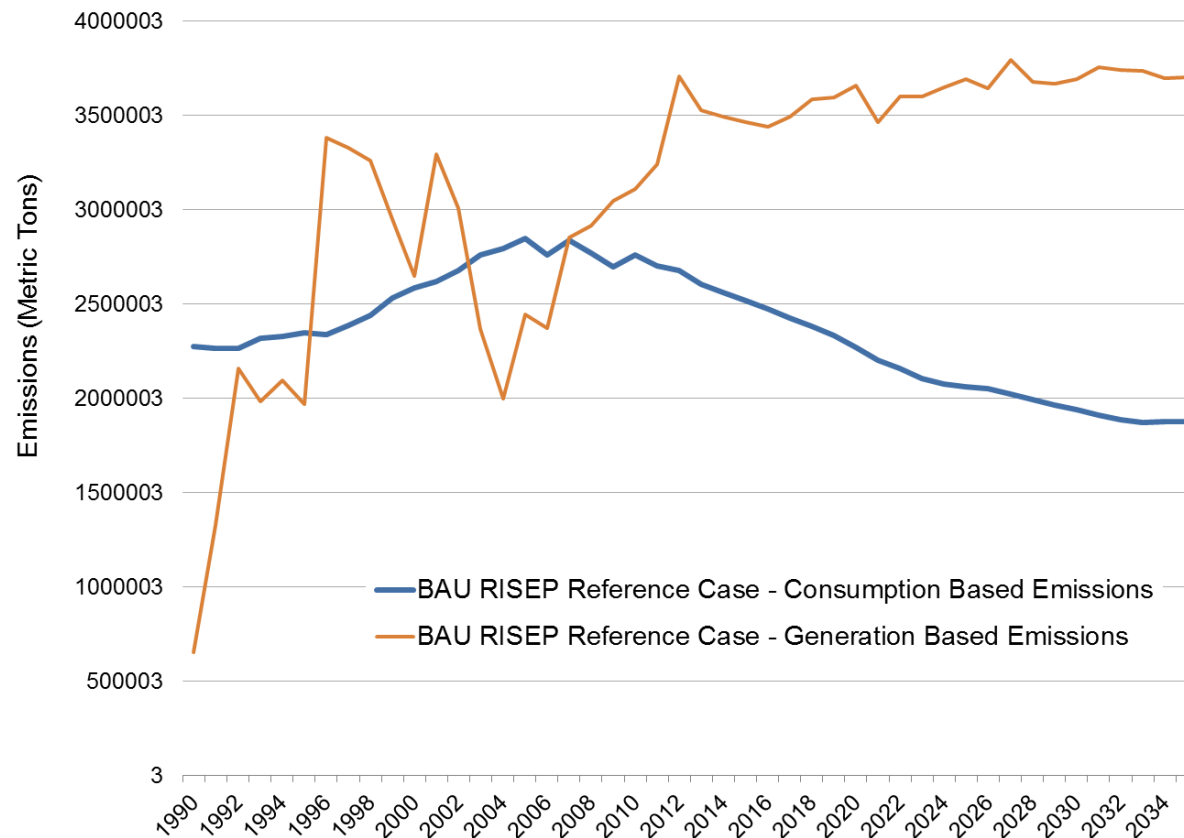
Rhode Island Electricity Consumption (Shows Electric Efficiency Impacts)



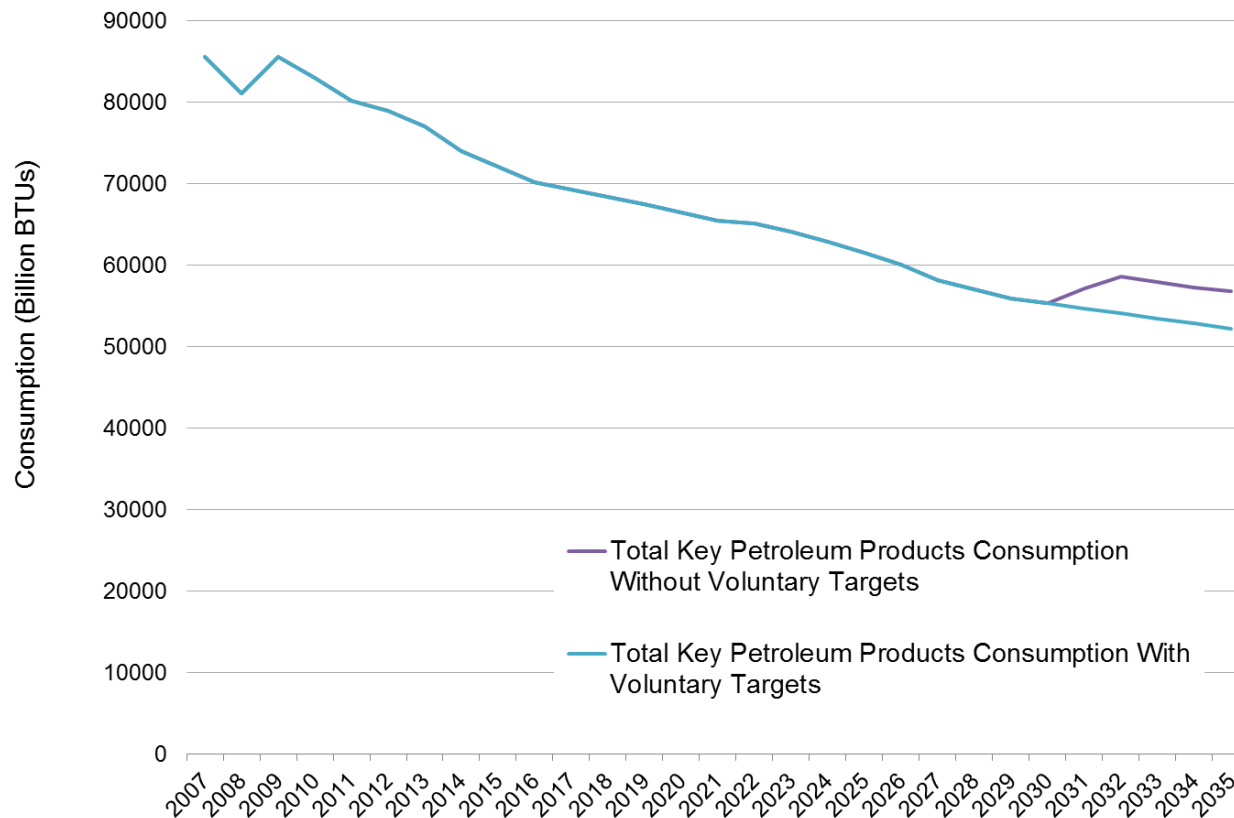
Rhode Island Electricity Expenditure (Shows RGGI Impact)



Electric Sector Consumption vs Generation Based Emissions



Petroleum Consumption Voluntary Targets Impact



Sources

- Comprehensive Energy Efficiency, Conservation, and Affordability Act of 2006, R.I.G.L. § 39-1-27.7, <http://www.rilin.state.ri.us/Statutes/TITLE39/39-1/39-1-27.7.HTM>.
- The Rhode Island Petroleum Savings and Independence Advisory Commission, <http://webserver.rilin.state.ri.us/Statutes/TITLE42/42-140.4/42-140.4-1.HTM>
- EIA AEO 2012 Assumption Document, [http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554\(2012\).pdf](http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554(2012).pdf)
- Based on VEIC Optimal Consultant Team RI Opportunity Report, <http://www.rieermc.ri.gov/documents/RI%20Gas%20Opportunity%20Report%202012.pdf>
- Rhode Island Public Utilities Commission Docket 4202, Electric and Natural Gas Least Cost Procurement Savings Targets for 2012-2014, [http://www.ripuc.org/eventsactions/docket/4202-EERMC-EST-Filing\(9-1-10\).pdf](http://www.ripuc.org/eventsactions/docket/4202-EERMC-EST-Filing(9-1-10).pdf)
- Based on KEMA RI Energy Efficiency Opportunity Report, <http://www.ripuc.org/eventsactions/docket/4202-EERMC-EST-KEMARept.pdf>

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[ENE \(Environment Northeast\)](#)

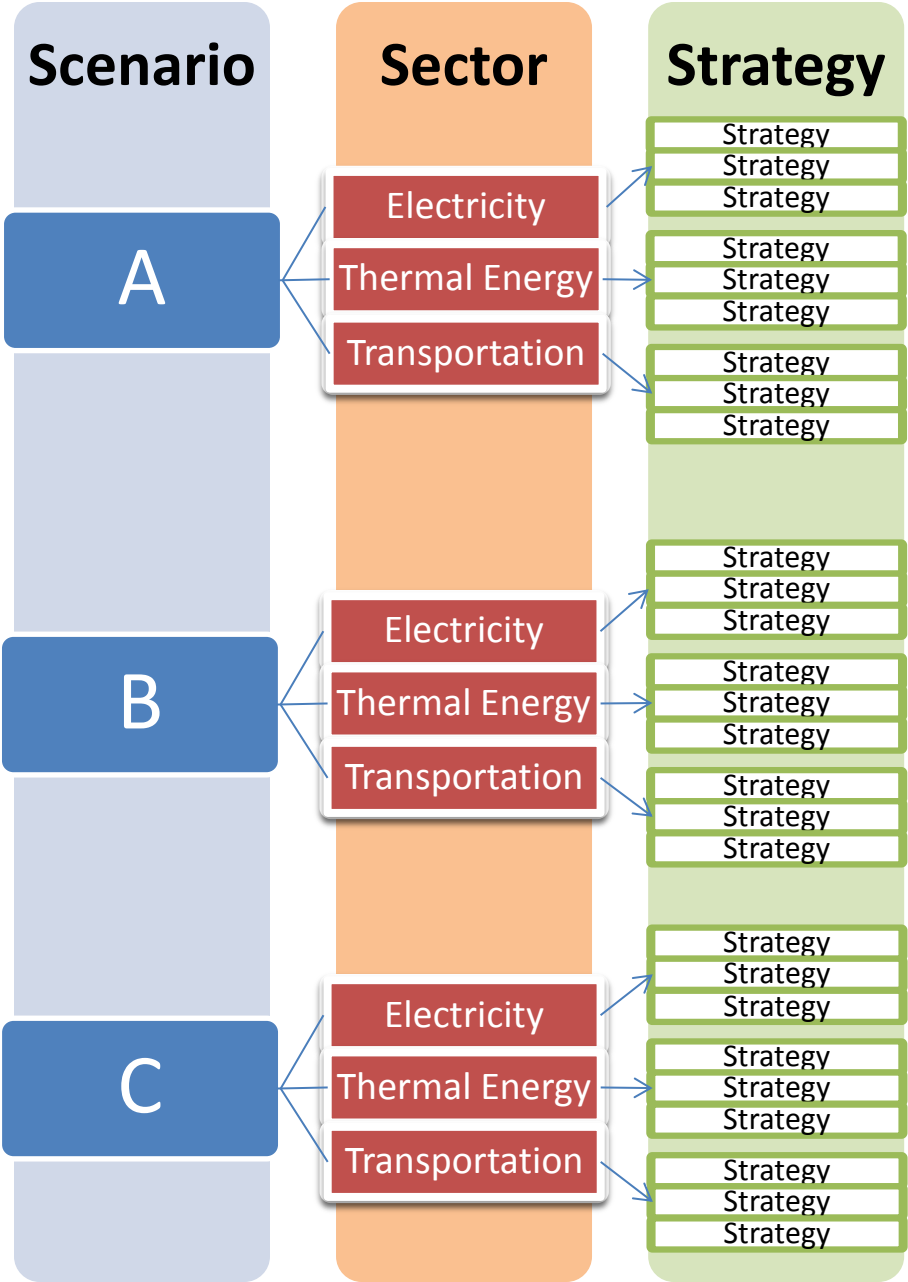
www.env-ne.org



Updated Directional Objectives

TASK 3: Goals

Modeling Analytical Framework



Directional Objectives (Criteria)

| 1 | 2 | 3 | 4 | 5 |
|----|----|----|----|----|
| + | - | + | ++ | -- |
| ++ | ++ | - | - | - |
| + | -- | -- | ++ | + |
| - | ++ | - | + | + |
| ++ | -- | -- | ++ | - |
| + | -- | - | + | + |
| + | + | ++ | - | - |
| - | + | ++ | -- | - |
| ++ | ++ | - | - | + |

Updated RISEP Vision Statement

VISION STATEMENT

*“In **2035**, Rhode Island will provide energy services across all sectors—electricity, thermal, and transportation—using a secure, cost-effective, and sustainable energy system.”*

Updated Directional Objectives

| PLAN CRITERIA | DIRECTIONAL OBJECTIVES | POSSIBLE METRICS |
|--------------------|---|--|
| SECURITY | A. ADEQUACY. Plan to meet overall energy supply needs | Supply=Forecasted Demand |
| | B. SAFETY. Increase the safety of energy conversion and use | Risk, frequency, and length of supply disruptions; Fuel diversity; Capacity and # of storage or backup power systems |
| | C. RELIABILITY. Increase the system's ability to withstand disturbances | |
| | D. RESILIENCY. Increase the system's ability to rebound from disturbances | |
| COST-EFFECTIVENESS | E. AFFORDABILITY. Lower overall energy bills | Annual expenditure (total, by sector, and per capita) |
| | F. STABILITY. Reduce the impacts of energy price volatility on consumers | Derivative of price, energy cost variance |
| | G. ECONOMIC GROWTH. Grow and maintain a healthy state economy | Gross State Product, annual in-state energy expenditure |
| | H. EMPLOYMENT. Increase employment | Job-years |
| SUSTAINABILITY | I. CLIMATE. Reduce greenhouse gas emissions from energy consumption | CO ₂ , CH ₄ , N ₂ O emissions |
| | J. AIR QUALITY. Reduce criteria pollution from energy consumption | SO ₂ , NO _x , particulate matter emissions |
| | K. WATER USE & QUALITY. Reduce the water impacts of energy consumption | Water use & quality indicators |
| | L. LAND & HABITAT. Reduce the impacts of energy projects on ecosystems | Area of land use conversion |
| | M. HUMAN HEALTH. Reduce the impacts of energy consumption on human health | Mortality, labor loss |

Introduction

TASK 3: SCENARIOS

RHODE ISLAND STATE ENERGY PLAN TECHNICAL ASSISTANCE

Advisory Council Meeting



April 1, 2013

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Today's agenda includes the following:



1. Introduction and Scope of Work



2. Task 3: Approach, Strategies, and Preliminary Scoring



3. Straw-man Scenarios



4. Next Steps



1. Introduction and Scope of Work

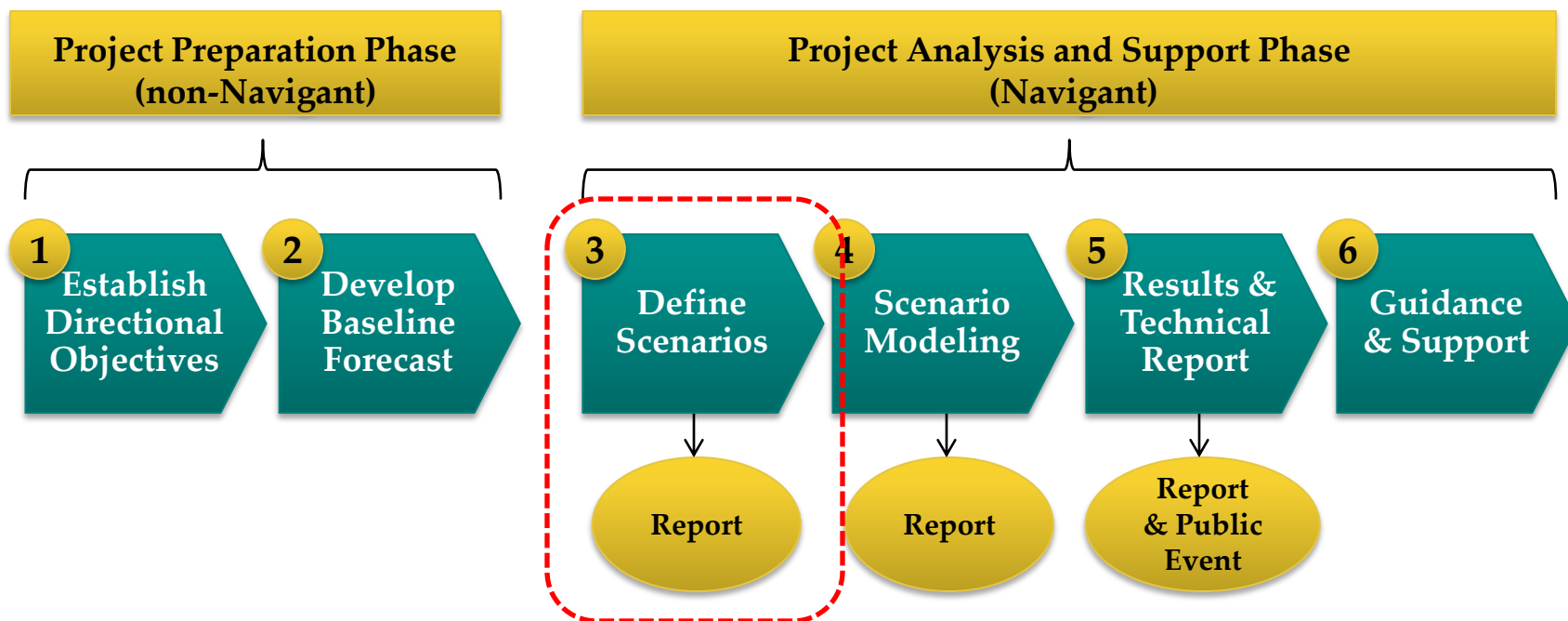
2. Task 3: Approach, Strategies, and Preliminary Scoring

3. Straw-man Scenarios

4. Next Steps

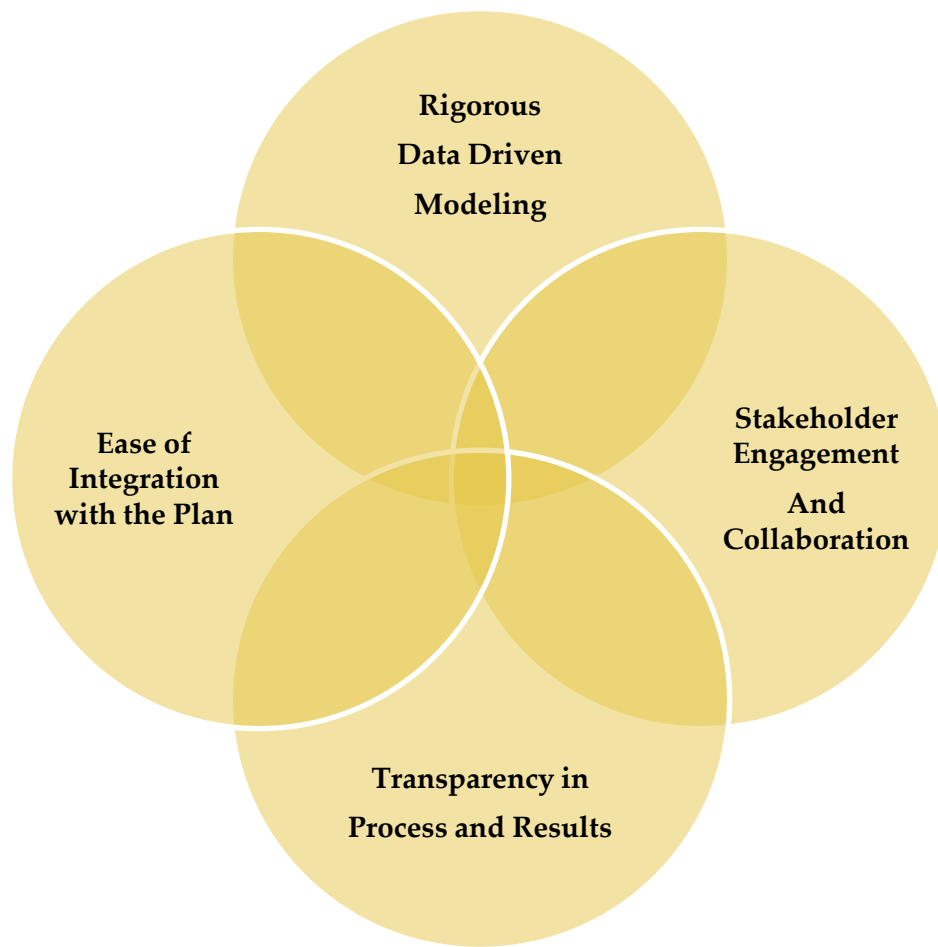
Navigant's approach follows tasks 3 through 6 of the RFP: Define scenarios, model scenarios, summarize results, and support RISEP.

Overview of Approach : Rhode Island State Energy Plan Technical Assistance



Navigant's role is to provide analysis that will inform the selection of goals, strategies, and policies for the Rhode Island State Energy Plan

- Identify realistic, actionable strategies across the electrical, thermal, and transportation sectors
- Define a set of rational, justifiable policy scenarios designed to meet Plan criteria; and
- Perform detailed economic and energy modeling analyses to quantify how well each scenario meets the Plan criteria



1. Introduction and Scope of Work



2. Task 3: Approach, Strategies, and Preliminary Scoring

3. Straw-man Scenarios

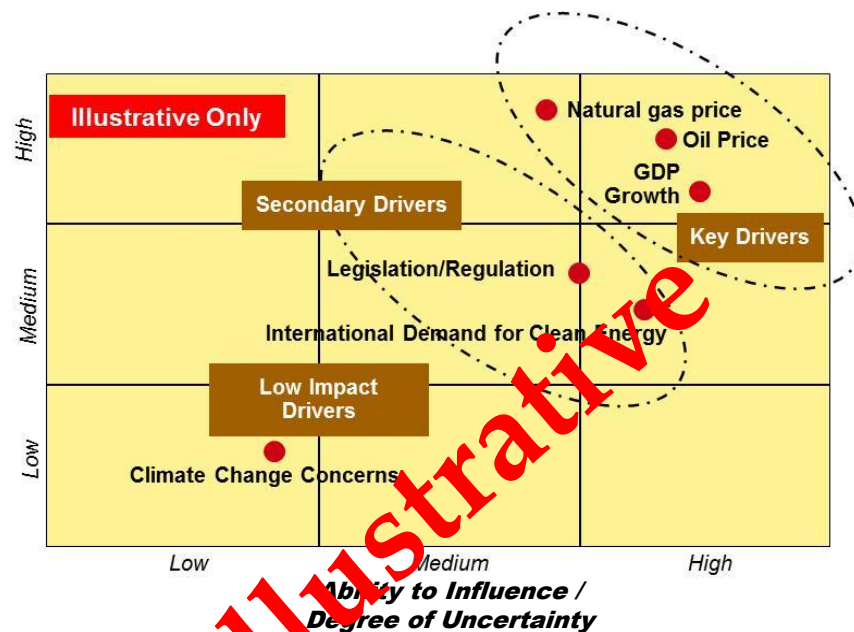
4. Next Steps

Navigant has identified strategies spanning electric, thermal, and transportation, and mapped these according to their potential impact.

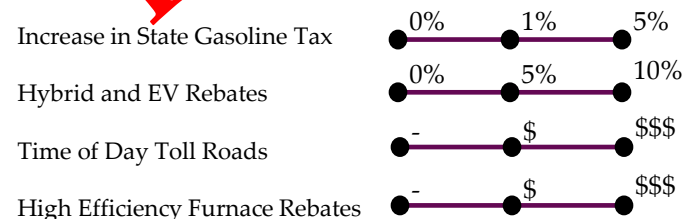
Modeling Analytical Framework

| Scenario (examples) | Sector | Strategy | Directional Objectives (Criteria) | | | | |
|--------------------------|----------------|----------|-----------------------------------|----|----|----|----|
| | | | 1 | 2 | 3 | 4 | 5 |
| Lowest Consumer Cost | Electricity | Strategy | + | - | + | ++ | -- |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| | Thermal Energy | Strategy | ++ | ++ | - | - | - |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| | Transportation | Strategy | + | -- | -- | ++ | + |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| Transform Energy Economy | Electricity | Strategy | - | ++ | - | + | + |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| | Thermal Energy | Strategy | ++ | -- | -- | ++ | - |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| | Transportation | Strategy | + | -- | - | + | + |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| Climate Protection | Electricity | Strategy | + | + | ++ | - | - |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| | Thermal Energy | Strategy | - | + | ++ | -- | - |
| | | Strategy | | | | | |
| | | Strategy | | | | | |
| | Transportation | Strategy | ++ | ++ | - | - | + |
| | | Strategy | | | | | |
| | | Strategy | | | | | |

Relative Impact



- Develop and prioritize a list of actionable strategies for each key sector.
- Propose and refine preliminary binding parameters to quantify the impact of each strategy.



The strategy identification process yielded over 100 discrete tactics, policies and programs to create change in Rhode Island's energy future.

| Sector | Category | Strategy | Tactics/Policies/Programs |
|----------------|-------------------|--|---|
| Transportation | Any | Upgrade Existing Infrastructure | Restore Obsolete Bridges and Highways |
| | Electric Vehicles | Promote the Deployment of Electric Vehicles | Expand Network of Electric Vehicle Charging Stations: Set a Goal |
| | | | Electric Vehicle Educational Program |
| | | | Financial Incentives |
| | | | Use of Electric Vehicles for State and Municipal Fleets |
| | Natural Gas | Promote the Conversion and Deployment of Natural Gas Fleets | Financial Incentives for Conversion to Natural Gas |
| | | | Increase the Number of CNG Stations: Set a Goal |
| | Efficiency | Promote Public Transit as a Viable Mean of Transportation | Develop a Park and Ride Program |
| | | | Expand RIPTA Services |
| | | Increase Fuel Economy and Decrease Emissions in Traditional Vehicles | Tail-Pipe Emissions Standards |
| | | | Financial Incentives for Fuel Efficient Vehicles: Vehicle Fee Waivers, Vehicle Tax Incentives |
| | | | Energy Efficiency Recognition Program |
| | | Increase Use of Biofuels in Transportation Mix | Financial Incentives for Biofuel Consumptions |
| | | | Develop an E85 Infrastructure |
| | Any | Increase Transportation Funding | Vehicle Miles Traveled Fee |
| | | | Increase State's Gas Tax and Vehicle Registration Fees |
| | | | New Petroleum Products Gross Receipts Tax |
| | | | Tolling on Interstate 95 |
| | | | Revenue Bonds |
| | | Promote Energy Research and Innovation in Universities | Energy Research Program at University of RI |
| | | Launch a Jobs in Energy Program | Clean Energy Business Solutions Program |
| | | | Community College Training for Energy Jobs |

- Sourced from:
 - State energy plans from CT, VT, MD, CO, and IA.
 - RI BRP Transportation
 - RI Transportation 2030
 - Initiatives outlined by the Advisory Council
 - Additional Brainstorming
- 59 Electric, 36 Thermal, and 22 Transportation tactics, policies and programs were bundled into higher level strategies directed at shifting Rhode Islands energy future relative to the BAU.

Strategies were scored based on the degree to which they meet each high level directional objective.

Following this meeting, we would like your input on strategy scoring, the development of additional strategies, and scenario refinement.

| Current Scenario | | | | Directional Objective Weightings for Scenario | | | | | Composite Score Based on Current Weighting |
|-----------------------------------|--|----------|-----------------------|--|---|---|--|--|--|
| Scenario 2 - Environmental Leader | | | | 20% | 10% | 10% | 60% | 0% | |
| # | STRATEGY | SECTOR | SELECTED? (binary) | SECURITY B. Safety C. Reliability D. Resiliency | COST EFFECTIVENESS E. Affordability F. Stability | ECONOMIC DEVELOPMENT G. GSP Growth H. Employment | SUSTAINABILITY I. Climate J. Air Quality K. Water Quality L. Land & Habitat M. Human Health | PARTICIPATION N. Choice O. Information | |
| 1 | Increase Energy Efficiency Awareness and Recognition | Electric | 0 | 2.0 | 7.0 | 1.0 | 1.0 | 4.0 | 1.8 |
| 2 | Advance Energy Efficiency Measures in New Construction | Electric | 0 | 4.0 | 6.0 | 10.0 | 4.0 | 1.0 | 4.8 |
| 3 | Advance Energy Efficiency Measures in Existing Construction | Electric | 1 | 7.0 | 5.0 | 10.0 | 5.0 | 4.0 | 5.9 |
| 4 | Advance Energy Efficiency for Appliances | Electric | 0 | 4.0 | 10.0 | 1.0 | 1.0 | 10.0 | 4.3 |
| 5 | Set/Maintain Energy Efficiency Targets for Utilities | Electric | 1 | 10.0 | 10.0 | 7.0 | 7.0 | 10.0 | 7.9 |
| 6 | Promote Use of Combined Heat and Power Equipment | Electric | 0 | 4.0 | 7.0 | 4.0 | 4.0 | 1.0 | 4.3 |
| 7 | Deploy Smart Grid Technologies and Programs at a Large Scale | Electric | 1 | 10.0 | 5.0 | 10.0 | 4.0 | 10.0 | 5.5 |
| 8 | Increase T&D efficiency | Electric | 1 | 10.0 | 4.0 | 4.0 | 4.0 | 1.0 | 5.2 |
| 9 | Increase Renewable Energy Awareness and Recognition | Electric | 0 | 1.0 | 1.0 | 4.0 | 1.0 | 7.0 | 1.3 |
| 10 | Promote the Development of Solar PV Projects | Electric | 1 | 4.0 | 1.0 | 7.0 | 6.0 | 7.0 | 5.2 |
| 11 | Promote the Development of Wind Projects | Electric | 1 | 1.0 | 4.0 | 7.0 | 6.0 | 1.0 | 5.5 |
| 12 | Promote the Development of Biomass Projects | Electric | 1 | 7.0 | 4.0 | 7.0 | 4.0 | 1.0 | 4.9 |
| 13 | Promote the Development of Hydro Projects | Electric | 0 | 4.0 | 1.0 | 4.0 | 1.0 | 1.0 | 1.9 |
| 14 | Purchase Electricity from Quebec Hydro Projects | Electric | 0 | 7.0 | 7.0 | 1.0 | 4.0 | 1.0 | 4.6 |

Electric Sector Goals and Strategies


- Expand Efficiency Initiatives Beyond Energy Conservation Efficiency and Affordability Act of 2006
 - Set more aggressive energy savings targets (i.e., go beyond the ‘prudent and reliable’ energy efficiency and energy conservation measures)
 - Perform regular review of targets in light of newly available technology
- Modernize Grid Infrastructure
 - Invest in grid modernization measures such as the deployment of new smart grid technologies
 - Micro-Grid pilot programs and distributed storage should also be considered in areas with critical services
- Roll-out New Programs to Reduce Peak Demand
 - Extend demand response to disaggregated customers incenting residential participation
 - Develop pricing programs to reduce peak demand through market signals
- Promote the Development of Renewable Energy Projects to Surpass Target of 16% by 2019
 - Offer creative financing mechanisms and streamline the interconnection process
- Procure Cheap Out-of state Electricity such as Hydroelectric Power from Quebec
- Expand Combined Heat and Power (CHP) Program
 - Extend Rhode Island’s CHP program to include residential applications (micro-CHP) and broaden its reach by easing the permitting process
- Increase In-state Capacity by Up-rating Natural Gas Fired Power Plants

Thermal Sector Goals and Strategies

- Expand Efficiency Initiatives Beyond Energy Conservation Efficiency and Affordability Act of 2006
 - Set more aggressive energy savings targets (i.e., go beyond the ‘prudent and reliable’ energy efficiency and energy conservation measures)
 - Perform regular review of targets in light of newly available technology
- Expand Access to Natural Gas
 - Invest in the expansion of Rhode Island’s natural gas distribution network to increase its capacity and the number of customers with direct access to natural gas
- Participate in Regional Planning to Obtain Secure Natural Gas Supply to RI
- Promote Equipment Conversion to Natural Gas
 - Market efficiency gains through pilot programs
 - Offer financial incentives to promote conversion market mechanisms
- Phase Out Electric Heating in RI
 - Implement state mandates
- Expand Combined Heat and Power (CHP) Program
 - Extend Rhode Island’s CHP Program to include residential applications (micro-CHP) and broaden its reach by easing the permitting process
- Promote Adoption of Solar Thermal and Geothermal

Transportation Sector Goals and Strategies

- Promote the Deployment of Electric Vehicles
 - Set goals for expanding the network of charging stations
 - Offer direct financial incentives to promote adoption
- Support the Conversion of State Fleet Vehicles to NGVs
 - Develop a pilot program and expand the network of public CNG/LNG filling stations
- Increase Fuel Options at Gas Stations
 - Develop an E85 infrastructure
- Increase Fuel Economy and Decrease Vehicle Emissions
 - Tail-pipe emissions standards
 - Aggressive fuel efficient vehicles fee waivers and tax incentives
- Encourage the Use of Public Transit
 - Extend RIPTA services, concentrating expansion around transportation nodes and most used networks
- Reduce Congestion
 - Planning between RIDOT and city planning organizations
 - Time of day tolling
 - Traffic monitoring and smart signaling technology
- Modernize RI's Existing Transportation Infrastructure
 - Upgrade bridges, highways and other critical infrastructure.

1. Introduction and Scope of Work
2. Task 3: Approach, Strategies, and Preliminary Scoring
-  3. Straw-man Scenarios
4. Next Steps

Navigant created 3 straw-man scenarios for discussion. These will be modified based on feedback from the Advisory Council.

**Scenario 1:
Least Cost Energy**

- Prioritizes cost-effective, common-sense energy solutions to promote economic development, while minimizing energy prices and expenditures in Rhode Island.

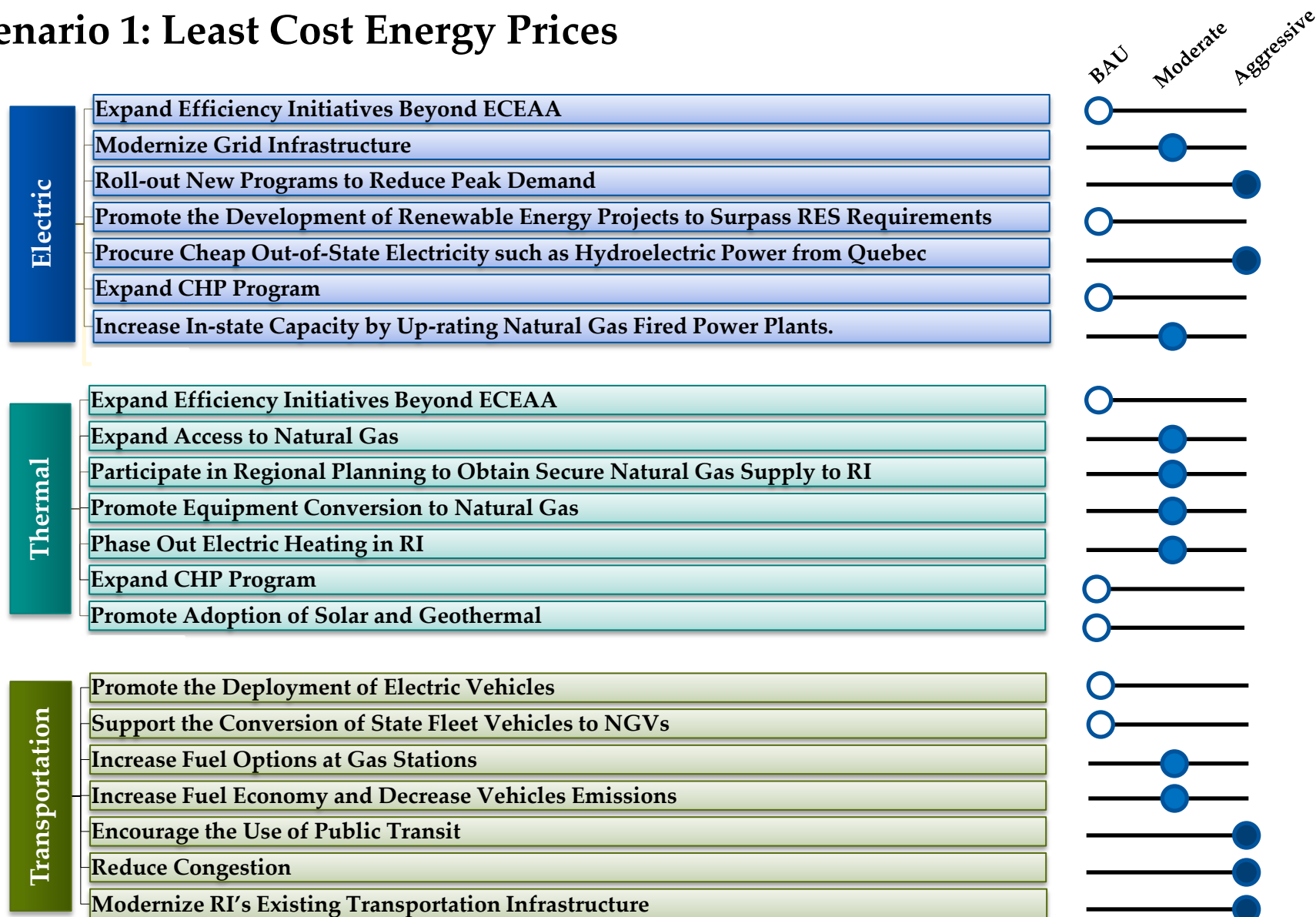
**Scenario 2:
Environmental Leader**

- Aims to cut GHG emissions and position Rhode Island as an environmental leader through significant investment in energy efficiency, smart grid solutions, and renewable energy.

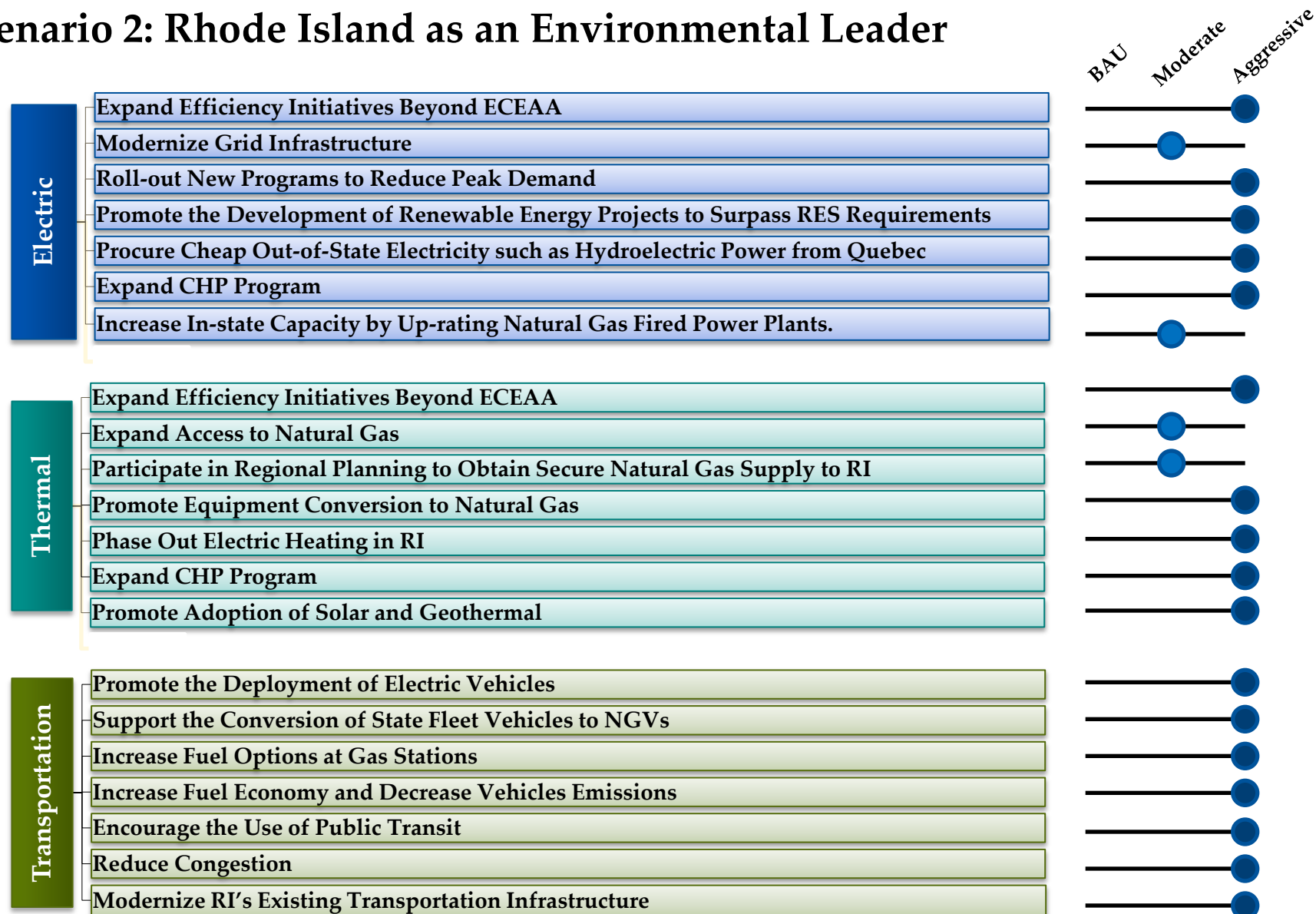
**Scenario 3:
Balanced Approach**

- Strikes a balance, focusing on creating long term stable energy prices and economic development while considering the long term environmental impact.

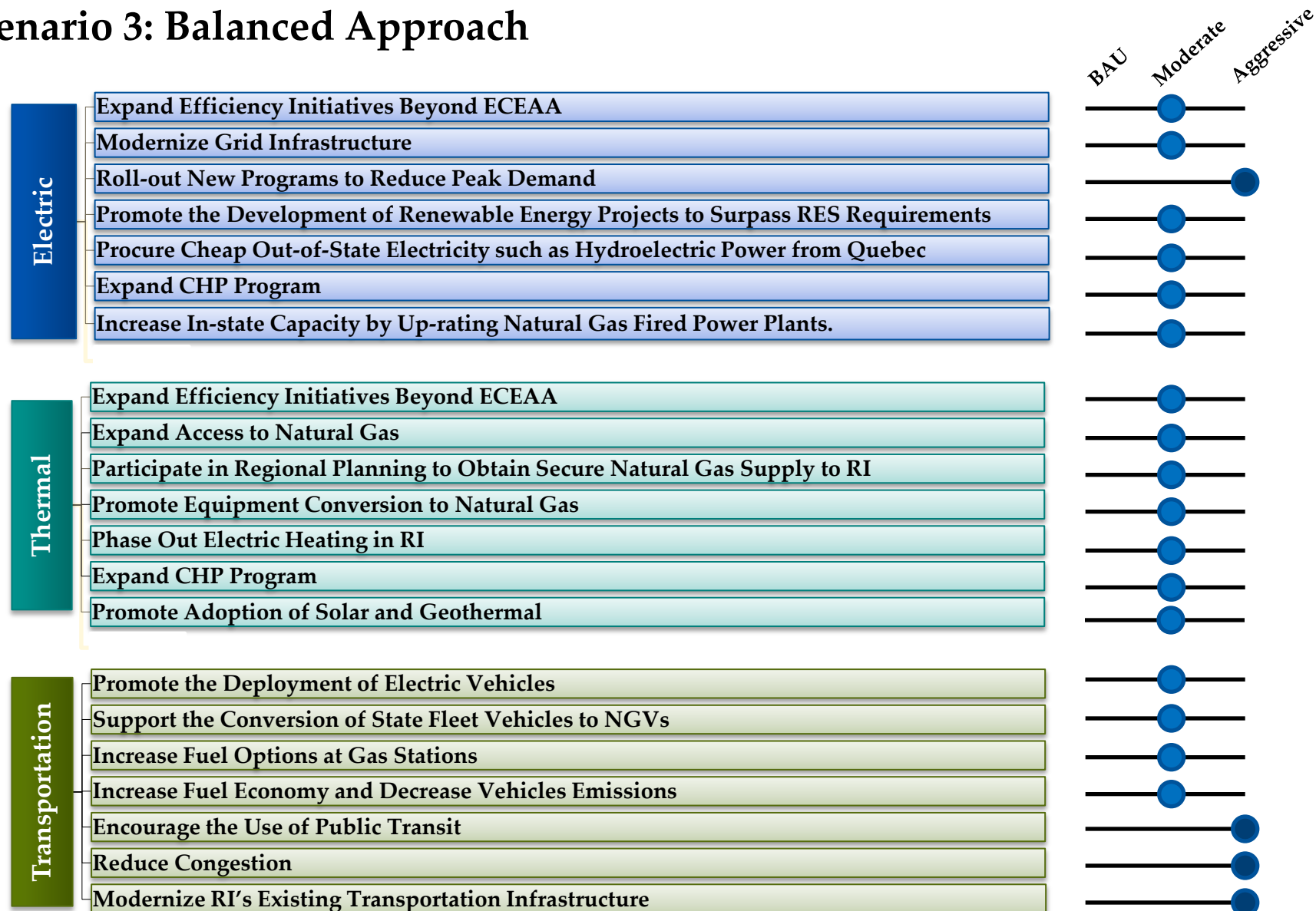
Scenario 1: Least Cost Energy Prices




Scenario 2: Rhode Island as an Environmental Leader

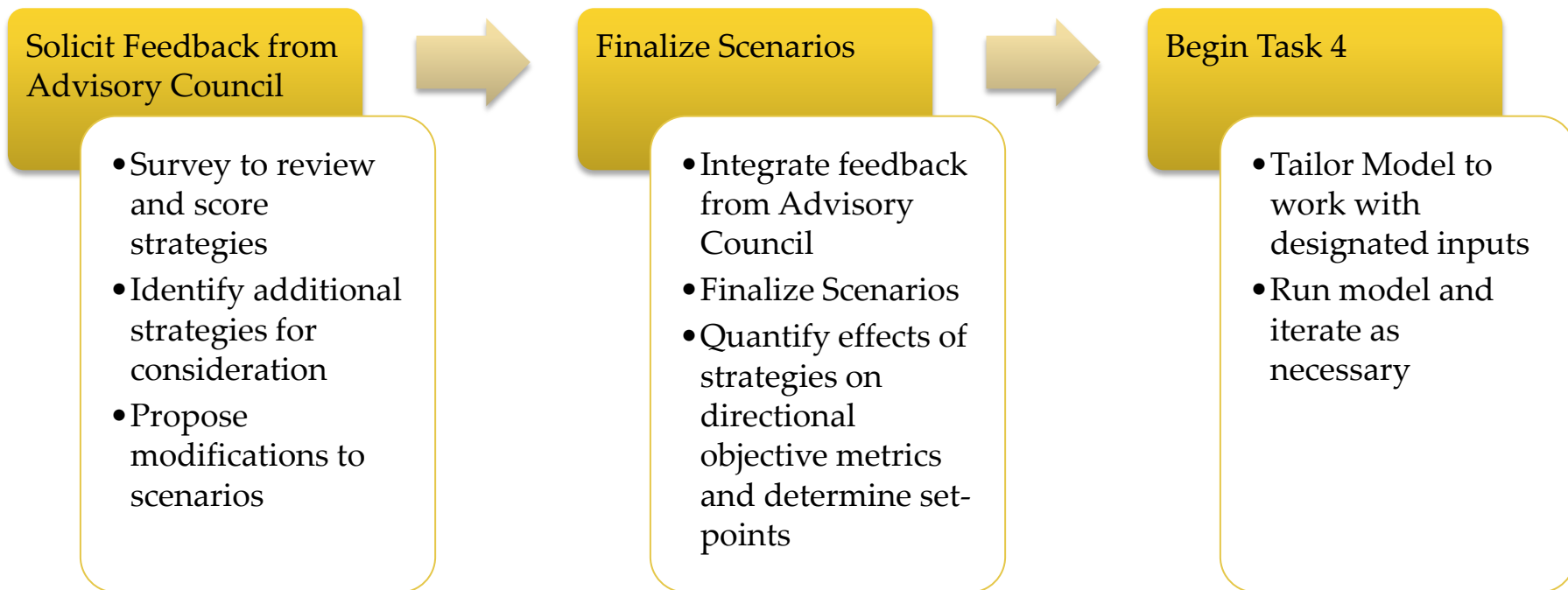


Scenario 3: Balanced Approach



1. Introduction and Scope of Work
2. Task 3: Approach, Strategies, and Preliminary Scoring
3. Straw-man Scenarios
-  4. Next Steps

Following this meeting, Navigant will solicit feedback from the Advisory Council, finalize the scenarios, and proceed with Task 4.



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Electric Sector Strategies Database (1 of 2)

| Sector | Category | Goal/Strategy | Tactic/Policy/Program |
|----------|------------|--|---|
| Electric | Efficiency | Increase Energy Efficiency Program Funding | Tariff Rider Surcharge |
| | | | Public Benefit Funds |
| | | Increase Energy Efficiency Awareness and Recognition | State-wide Energy Efficiency Marketing and Branding |
| | | | Energy Efficiency Recognition Program: Annual Awards for Best in Class |
| | | | Energy Efficiency Educational Program |
| | | Advance Energy Efficiency Measures in New Construction | Energy Efficiency Standards/Codes |
| | | | Creative Project Financing: On-bill Financing |
| | | | Easier Permitting Process and Reduce Permitting Fee |
| | | | Financial Incentives: Tax Credits |
| | | | Define Green Building Requirements |
| | | Advance Energy Efficiency Measures in Existing Construction | Push for Net Zero Buildings |
| | | | Energy Efficiency Standards/Codes |
| | | | Creative Project Financing: On-bill Financing |
| | | | Require Efficiency Upgrades at the Time of Sale |
| | | | Ease the Energy Efficiency Retrofit Process (one-stop shop) - <i>notably for residential market</i> |
| | | Advance Energy Efficiency for Appliances | Financial Incentives: Tax Credits |
| | | | Define Green Building Requirements |
| | | Set/Maintain Energy Efficiency Targets for Utilities | Energy Efficiency Appliances Standards |
| | | | Financial Incentives: Rebates for Energy Efficient Appliances |
| | | | Energy Efficiency Portfolio Standards (EEPS) |
| | | | Use of "White Tags" - Market Mechanism to Facilitate ESCO Involvement |
| | | Promote Use of Combined Heat and Power Equipment | Revenue Decoupling (<i>removes barriers to EE</i>) |
| | | | Lost Margin Recovery (<i>removes barriers to EE</i>) |
| | | | Offer Incentives: Favorable Tax Treatment, Special Rates |
| | | Deploy Smart Grid Technologies and Programs at a Large Scale | Ease Interconnection Requirements |
| | | | Advanced Metering Programs: TOU/CPP |
| | | | Smart Grid Pilot |
| | | | Flat or Inverted Block Rates |
| | | | Demand Response Program |
| | | Increase T&D efficiency | Net Meters Installation |
| | | | Utilities to Identify and Upgrade T&D System to Reduce Losses |
| | | | Protect the Electric Grid |

Electric Sector Strategies Database (2 of 2)

| Sector | Category | Goal/Strategy | Tactic/Policy/Program |
|----------|------------|---|--|
| Electric | Renewables | Increase Renewable Energy Awareness and Recognition | State-wide Renewable Energy Marketing and Branding |
| | | | Renewable Energy Recognition Program: Annual Awards for Best in Class |
| | | | Renewable Energy Educational Program |
| | | Promote the Development of Solar PV Projects | Net Metering Program |
| | | | Creative Financing Mechanisms: Property Assessed Clean Energy |
| | | | Financial Incentives |
| | | | Set Solar PV Deployment Targets |
| | | | Increase the Dead Load Requirements for Flat and Sloped Roofs (rooftop solar PV) |
| | | Promote the Development of Wind Projects | Streamline Interconnection Process |
| | | | Net Metering Program |
| | | | Creative Financing Mechanisms: Property Assessed Clean Energy |
| | | | Financial Incentives: Sales Tax Exemption, Federal Investment Tax Credit |
| | | | Set Wind Deployment Targets |
| | | Promote the Development of Biomass Projects | Streamline Interconnection Process |
| | | | Creative Financing Mechanisms |
| | | Promote the Development of Hydro Projects | Financial Incentives: Sales Tax Exemption, Federal Investment Tax Credit |
| | | | Streamline Interconnection Process |
| | | | Creative Financing Mechanisms |
| | | Purchase Electricity from Quebec Hydro Projects | Financial Incentives: Sales Tax Exemption, Federal Investment Tax Credit |
| | | | Negotiate Long-Term Power Purchase Agreement with Hydro Generators |
| | | Become a Renewable Energy Manufacturing Hub | Financial Incentives to Manufacturers: Tax Breaks |
| | | | Promote RI as a Center of Excellence for Renewable Energy R&D |
| | NG | Deploy Additional Natural Gas Fired Power Plants in RI | Secure Long-Term Supply of Natural Gas from Marcellus Shale |
| | Any | Purchase Lowest Price Electricity from Neighboring States | Negotiate Long-Term Power Purchase Agreement with Low Price Generators |
| | | Promote Energy Research and Innovation in Universities | Energy Research Program at University of RI |
| | | Launch a Jobs in Energy Program | Clean Energy Business Solutions Program |
| | | | Community College Training for Energy Jobs |

Thermal Sector Strategies Database

| Sector | Category | Goal/Strategy | Tactic/Policy/Program |
|---------|------------|---|---|
| Thermal | Efficiency | Increase Energy Efficiency Program Funding | Tariff Rider Surcharge Public Benefit Funds |
| | | Increase Energy Efficiency Awareness and Recognition | State-wide Energy Efficiency Marketing and Branding Energy Efficiency Recognition Program: Annual Awards for Best in Class Energy Efficiency Educational Program |
| | | Advance Energy Efficiency Measures in New Construction | Energy Efficiency Standards/Codes Creative Project Financing: On-bill Financing Easier Permitting Process and Reduce Permitting Fee Financial Incentives: Tax Credits Define Green Building Requirements |
| | | Advance Energy Efficiency Measures in Existing Construction | Energy Efficiency Standards/Codes Creative Project Financing: On-bill Financing Require Efficiency Upgrades at the Time of Sale Ease the Energy Efficiency Retrofit Process (one-stop shop) - <i>notably for residential market</i> Financial Incentives: Tax Credits Define Green Building Requirements |
| | | Set/Maintain Energy Efficiency Targets for Utilities | Energy Efficiency Portfolio Standards (EEPS) Use of "White Tags" - Market Mechanism to Facilitate ESCO Involvement Revenue Decoupling (<i>removes barriers to EE</i>) Lost Margin Recovery (<i>removes barriers to EE</i>) |
| | | Promote Use of Combined Heat and Power Equipment | Offer Incentives: Favorable Tax Treatment, Special Rates Ease Interconnection Requirements Streamline Permits and Approvals (one stop) |
| | | Promote Equipment Conversion to Natural Gas | Financing Options for Equipment Conversion to NG Financial Incentives for Equipment Conversion to NG |
| | | Expansion of Natural Gas Pipeline Network | Natural Gas Pipeline Expansion Gas Main Connections Regulations Ease Permitting and Siting Process: Streamline Permits and Approvals (one stop-shop) Participate in Regional Planning to Obtain a Secure NG Supply to RI |
| | | Phase Out Electric Heating | Regulations Financial Incentives |
| | Renewables | Promote Solar Thermal | Ease Permitting Process Financial Incentives |
| | Any | Promote Energy Research and Innovation in Universities | Energy Research Program at University of RI Clean Energy Business Solutions Program |
| | | Launch a Jobs in Energy Program | Community College Training for Energy Jobs |

Transportation Sector Strategies Database

| Sector | Category | Goal/Strategy | Tactic/Policy/Program |
|----------------|-------------------|--|---|
| Transportation | Electric Vehicles | Promote the Deployment of Electric Vehicles | Expand Network of Electric Vehicle Charging Stations: Set a Goal |
| | | | Electric Vehicle Educational Program |
| | | | Financial Incentives |
| | | | Use of Electric Vehicles for State and Municipal Fleets |
| | Natural Gas | Promote the Conversion and Deployment of Natural Gas Fleets | Financial Incentives for Conversion to Natural Gas |
| | | | Increase the Number of CNG/LNG Stations: Set a Goal |
| | Efficiency | Promote Public Transit as a Viable Mean of Transportation | Develop a Park and Ride Program |
| | | | Expand RIPTA Services |
| | | Increase Fuel Economy and Decrease Emissions in Traditional Vehicles | Tail-Pipe Emissions Standards |
| | | | Financial Incentives for Fuel Efficient Vehicles: Vehicle Fee Waivers, Vehicle Tax Incentives |
| | | | Energy Efficiency Recognition Program |
| | | Increase Use of Biofuels in Transportation Mix | Financial Incentives for Biofuel Consumptions |
| | | | Develop an E85 Infrastructure |
| | Any | Increase Transportation Funding | Vehicle Miles Traveled Fee |
| | | | Increase State's Gas Tax and Vehicle Registration Fees |
| | | | New Petroleum Products Gross Receipts Tax |
| | | | Tolling on Interstate 95 |
| | | | Revenue Bonds |
| | | Promote Energy Research and Innovation in Universities | Energy Research Program at University of RI |
| | | Launch a Jobs in Energy Program | Clean Energy Business Solutions Program |
| | | | Community College Training for Energy Jobs |
| | | Ease Congestion | Coordinated transportation infrastructure planning |
| | | | Time of day tolling in urban centers |
| | | | Active Transit Monitoring and Signalling Systems |
| | | Upgrade Existing Infrastructure | Restore Obsolete Bridges and Highways |

Next Steps

Next Steps

Next Steps:

- A survey tool will be sent around for Advisory Council members to complete post-meeting
- **The next meeting will be the week of May 22nd – A doodle will be circulated**